Hitchcock's Machine Tool Blue Book

ARCH, 1937 THIRTY-SECOND YEAR

ARDINGE Ball Bearing Bench Lathe Unit

PRECISION

Offered with Properly Designed Cabinet or Braced Bench Driving Unit.
1" Collet Capacity—9" Swing—Four Smaller Sizes.

Ask for Bulletin BB.

RDINGE BROTHERS, INC., - ELMIRA, N. Y.
AGO — NEW YORK — PHILADELPHIA — DETROIT — HARTFORD
Sales Representatives in All Principal Cities

UBLISHED AT 508 So. DEARBORN ST. CHICAGO

MARVEL
NO. 8
(Metal Cutting)
BAND SAW

The most remarkable saw for business. It work from 14"x14" to 18"x18" cross sections at any angle from 45° right to 45° left. Both hand and power feed with large flat plane-type feed that swallows cutting up of even the largest and most cumbersome work.

Saves "warehouse cutting extras." Saves incomparable planer, shaper and milling machine losses resulting to saw and plane. Does all ordinary sawing effectively as well as numerous, notching and many special operations. The MARVEL No. 8 is the logical saw for any shop—is one of the lightest and most portable machine tools.

MARVEL

ARMSTRONG BLUM MFG. CO.

"The Hack Saw People"

[illegible] N. Francisco Ave. CHICAGO, U. S. A.

ESS BREAKAGE

See the Difference

WELDON

STRONGER

1. No nicks to weaken teeth on the end of mill.
2. Heavy feeds will not clog end.
3. Formed teeth. Designed for strength, with lots of chip clearance.
4. Heat treated for a certain characteristic grain structure.

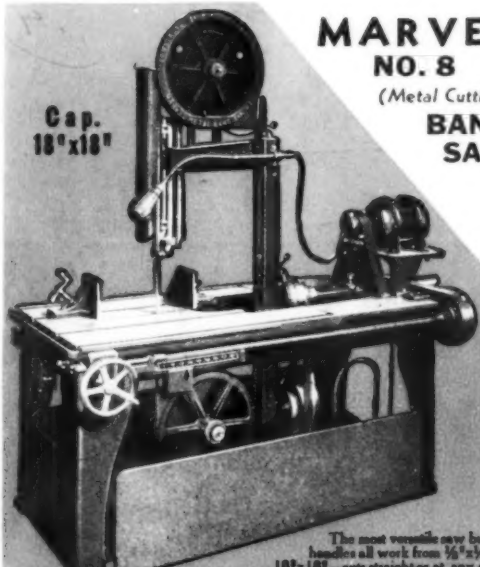
LET THE END MILL ITSELF PROVE IT!

The WELDON TOOL CO.

"Pioneers in Fast Spiral Double-end, End Mills"

321 FRANKFORT AVE.
CLEVELAND, OHIO

MARVEL
NO. 8
(Metal Cutting)
BAND SAW



The most versatile saw built—handles all work from ⅛"x⅛" to 18"x18"—cuts straight or at any angle from 45° right to 45° left. Both hand and power feed with large flat planer-type bed that simplifies setting up of even the largest and most cumbersome work.

Saves "warehouse cutting extras." Saves innumerable planer, shaper and milling machine hours roughing to size and shape. Does all ordinary sawing efficiently as well as mitering, notching and many special operations. The MARVEL No. 8 is the logical first saw for any shop—is one of the busiest and most profitable machine tools.

Write for Bulletin 800-A

ARMSTRONG BLUM MFG. CO.

"The Hack Saw People"

341 N. Francisco Ave., CHICAGO, U. S. A.

ESS BREAKAGE

See the Difference

WELDON

CUPPED END
END-MILL

DINARY
D-MILL

STRONGER

1. No nicks to weaken teeth on the end of mill.
2. Heavy feeds will not clog end.
3. Formed teeth. Designed for strength, with lots of chip clearance.
4. Heat treated for a certain characteristic grain structure.

LET THE END MILL ITSELF PROVE IT!

PAT.
PEND.

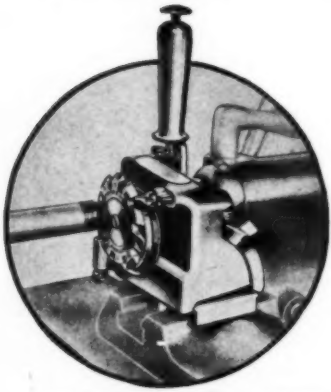
The
WELDON TOOL CO.

"Pioneers in Fast Spiral Double-end, End Mills"

321 FRANKFORT AVE.
CLEVELAND, OHIO

Rivett

IMPROVED THREAD TOOL



LOW COST THREADS IN QUANTITY

Rivett Thread Tool mounts on any screw cutting engine lathe and cuts any diameter or form (except square) of thread, six pitch or finer. The Thread Tool is a holder for a ten tooth cutter with means for indexing the cutter to present each of the ten teeth successively to the work.

For complete details see Bulletin 110-A

Rivett Lathe & Grinder, Inc.

Brighton, Boston, Mass.

Hitchcock's
Machine Tool Blue Book

Selected Circulation — 25,000 Monthly

MARCH, 1937 — THIRTY-SECOND YEAR

Index Of Machine Tool Orders

The Index for January was 200.3, which is well above any previous month expcet December.

No doubt a large part of this heavy volume is due to the fact that machine tool users can offset higher taxes, higher wages and other increasing costs by the use of efficient machinery.

Machine tool builders are keeping up with the procession in the production of cost-saving machines. Users are also falling in line, to their profit.

The prospects for the remainder of the year are excellent.

Published By

Hitchcock Publishing Co.

508 S. Dearborn St., Chicago, Ill.

Consult the Classified Finding Index for your requirements

COLLET AND FEE

Collets for your Lathes and Milling Machines

All types and sizes carried in stock for prompt shipment

Collets for your lathes and milling machines when you want them . . . instantly . . . promptly! HARDINGE Collets—recognized for accuracy and durability since 1890—are held in stock in sufficiently large quantities in Elmira, Chicago, New York, Detroit and Los Angeles to insure immediate delivery at any time.

This prompt service includes HARDINGE Collets for American, Burke, Cataract, Flather, Hendey, LeBlond, Monarch, Porter - Cable, Pratt & Whitney, Rockford, Sebastian, Sidney, South Bend, Sundstrand, Van Norman and all other lathes and milling machines.

Ask for bulletin No. 36

—ALWAYS SPECIFY HARDINGE COLLETS—

HARDINGE BROTHERS, Inc. - - - ELMIRA, N. Y.

FINGER SECTION

Collets and Feed Fingers for your Automatic and Hand Screw Machines

Standard sizes in stock for immediate delivery

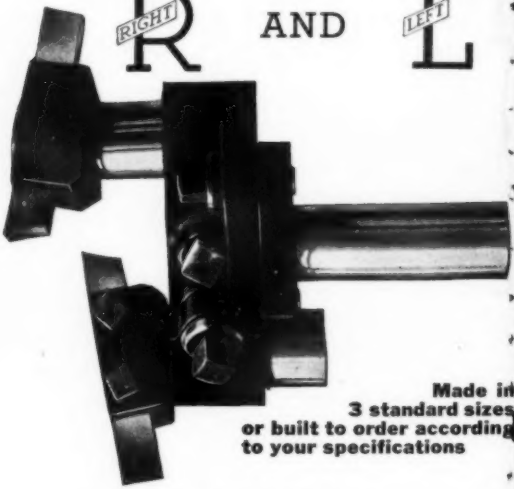
Typical MORRISON quality and quick delivery are planned to meet with the satisfaction of all users of Collets, Feed Fingers and Pads for Brown & Sharpe, Cleveland, Cone, Gridley, National Acme, New Britain, Davenport and all other automatic screw machines. MORRISON Collets also for Bardons & Oliver, Foster, Garvin, Pratt & Whitney, Warner & Swasey, and all other hand screw machines.

Ask for catalog No. 34-A

—MORRISON MEANS ECONOMY AND PERFORMANCE—

MORRISON MACHINE PRODUCTS, Inc., ELMIRA, N. Y.

RIGHT R AND LEFT L



Made in 3 standard sizes or built to order according to your specifications

Save On Your Set-Up Costs With This Combination Tool

By using various adjustments, one R & L turning tool can be made to perform a variety of operations, singly or together, thereby saving not only tool costs but time required for setting up machines. Extremely fine adjustments are provided both on the tool and on the pressure of the burnishers.

Ask for complete details

R AND L TOOL

Turning Tool

Entire tool is made of heat — treated alloy steel

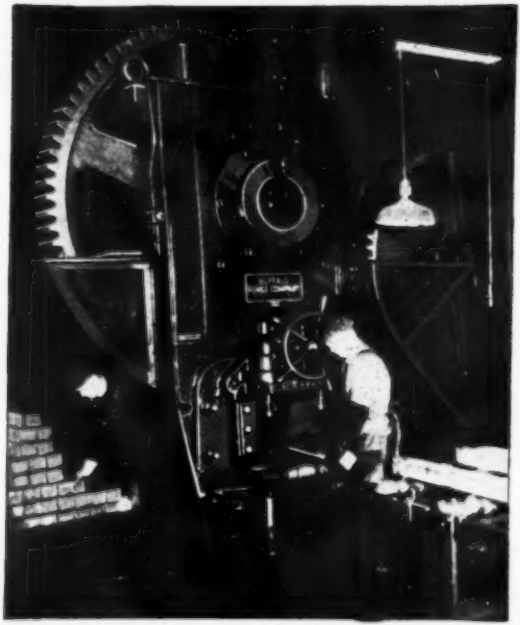
Easily Changed In 10 Seconds For Right Or Left Hand Work

Speed in making set-ups is essential to economy. An R & L Turning Tool can be assembled and adjusted quickly for almost any kind of turning work. Tantalum carbide faces on the backrest act as a burnisher, eliminating rollers and misalignment due to roller wear and producing a highly polished surface.

Send today for your booklet

Nicetown, Philadelphia, Pa.

"Buffalo" BAR and



BUFFALO

161 Mortimer St.,

Branch Engineering Offices in Principal Cities

CUTTERS BILLET SHEARS

. . . *for those tough* SHEARING JOBS

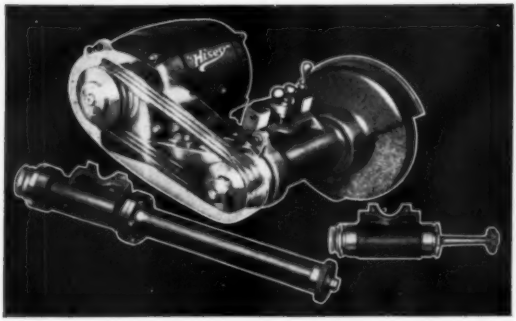
That is, you may think they are tough until you put one of these **super cutters** to work in your plant. Designed to cut angles, bars, flats, rounds and squares. The choice of the leading motor car manufacturers, they will be **your** choice too, once you get all the facts on "Buffalo" Bar Cutters and Billet Shears.

Recommendations to fit your requirements gladly submitted without obligation.

FORGE COMPANY

Buffalo, N. Y.

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



YOUR LATHE is a Grinder!

Either internal or external—your boring mill too—and planer can be used for numerous grinding operations. A **HISEY** Wide Range Precision Grinder converts any machine tool into a grinder capable of handling rolls, surface plates, dies, bearings, journals, mandrels, cutters, etc. There are a number of sizes and types equally adapted for production work as well as for those thousand and one odd grinding jobs which crop up in every shop and tool room.

Catalog 51H on request!

THE HISEY-WOLF MACHINE CO.

"It's High Grade If Hisey Made"

Hisey

Established 1896
CINCINNATI, OHIO, U.S.A.

Electric **DRILLS . . . GRINDERS . . . BUFFERS**

Save

with

EKLIND

High Speed

MILLING

ATTACHMENTS

•

Efficiency

on

END MILLING PROBLEMS

•

Correct Speeds Rigidity and Ease of Handling Mean -

- reduced breakage of end mills
- fewer sharpenings
- faster cutting
- minimized set-up time
- high quality work

the MODEL 4H
(illustrated)
will

MILL, DRILL AND BORE
in
ONE SET-UP

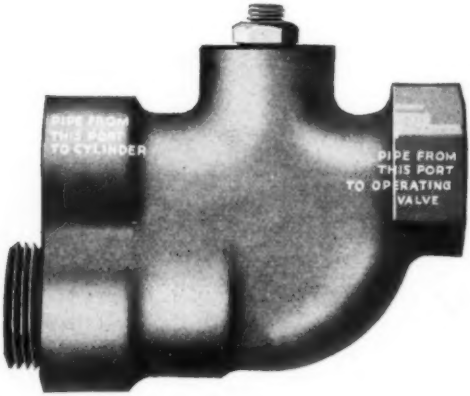
Four inch quill travel
Six Speeds (250-4000)

Write for prices and information

UNIVERSAL HIGH SPEED TOOL CO.
549 Washington Blvd., Chicago, Illinois

T-J SPEED CONTROL VALVE

for Compressed Air Cylinders



Control the speed of your cylinders. Make them function as fast or as slow as you wish, without affecting the pressure of course. Pipe one of these in the line from the operating valve to the cylinder, or if both the forward and reverse strokes are to be controlled, pipe one in the line to both ends of the cylinder.

These valves are available in ¼", ⅜", ½", ¾", and 1" I. P. S.

THE TOMKINS-JOHNSON CO.

605 N. Mechanic St., -:- Jackson, Mich.

1905 **Strand** 1937

FLEXIBLE SHAFTS

Type M P 5

FLEXIBLE SHAFTS
AND
MACHINES

FOR THE
METAL PATTERN SHOP
MACHINE SHOP
DIE SHOP and ALL METAL WORKING PLANTS

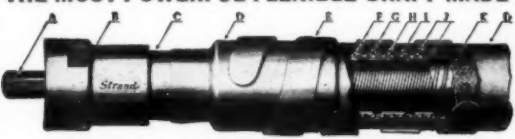
HIGH QUALITY MACHINES ONLY

Type M 6 C

Type R F M 4

— ROTARY FILES —

THE MOST POWERFUL FLEXIBLE SHAFT MADE



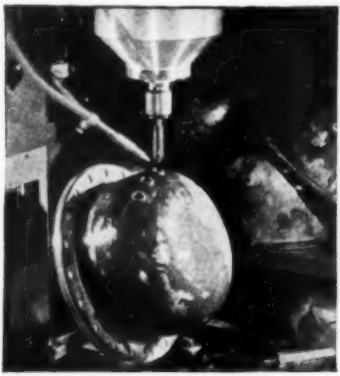
Send for our Catalog—Sixty Types and Sizes
FLEXIBLE SHAFT MACHINES

Manufactured by

N. A. STRAND & CO.

5001-5009 No. Lincoln St. CHICAGO

ANGLE TAPPING *with* ABSOLUTE UNIFORMITY



One of a series of case histories showing tough jobs made easy by the Haskins Tapper.

Material ..... **Drawn Steel Shell**
Production ..... **(3 holes) 330 pieces per hour**
Size of Tap ..... **¼" straight pipe**
Style of Tap ..... **4 flute, cam face, special length**
R.P.M. of Tap 'in' **550**
R.P.M. of Tap 'out' **1100**

A job "That Couldn't be Done" . . . NOW Done by the HASKINS Method

This job was a problem due to the fact that the face of the tapped holes is not at right angles to the tap. The tap must start cutting the thread on one side before the chamfer enters the hole. No three holes could be tapped alike. But Haskins had the answers: a rigid spindle . . . foot-pedal control . . . a simple fixture. No clamps. No hold-downs. Result: Three holes tapped on an angle with *absolute uniformity*. Write today for illustrated booklet. R. G. Haskins Co., 4654 W. Fulton St., Chicago.

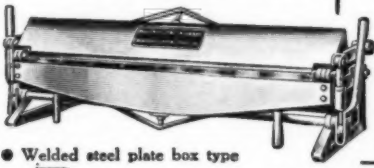
Haskins
Hi-Speed TAPPING EQUIPMENT

WHITNEY
METAL TOOL CO.

Imperial Roller Bearing Punches

Offered in 3 sizes. Will work inside 90 degrees. Quick changing for punches and dies. No cams to wear. Stripping action positive.

Whitney JENSEN *Portable* BRAKE



"Air Conditioning Special"

BENCH TYPE

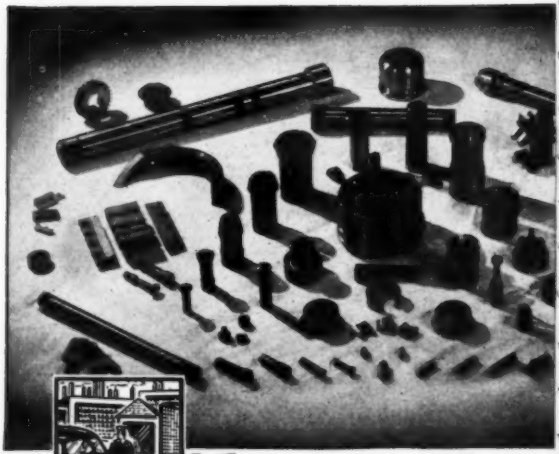
Two Models

The Bench Type can be quickly converted to a Floor Type machine by the addition of a sub-base held with 4 bolts.

- Welded steel plate box type jaws.
- Capacity, 49 in. width, 20 ga. material.
- Weight, only **265 lbs.**
- Self-locking clamping handles.
- Can be carried easily by two men.
- Quickly adjustable for different gauges.
- Has every feature of a standard brake.

Send today for catalog showing 80 types of Whitney Punches and Shears.

ROCKFORD, ILLINOIS



Keeping Pace

WITH THE INDUSTRIAL

MODERN PRODUCTS—in constant use by both motor car manufacturers and suppliers—play an important part in the production of *every* automobile made in this country. And in our list of over 1800 customers are included the leaders in every other major division of American industry. Built for dependable service, priced right, and delivered promptly, MODERN PRODUCTS are meeting every requirement of busy production men everywhere. If *your* needs call for one screw machine part or tool or a completely rebuilt machine—go to the "leader that supplies the leaders." Specify "MODERN PRODUCTS!"

MODERN COLLET & MACHINE CO.

"MODERN" CAMS

Unequalled for Durability and Extreme Accuracy.

LEAD CAMS with an alloy steel face—further advanced in principle yet cost no more than any similar cams . . . BULLARD CAMS—furnished regularly to many of the country's largest manufacturers . . . CUT OFF AND FORM CAMS — made of a special alloy steel that will absorb any shock. Leads are milled to precision accuracy, insuring long life to your cutting tools. Any 'MODERN' cam—whether standard type or made to your specifications —assures the utmost in production efficiency. Your own experience will prove it!

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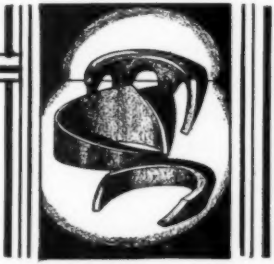
LEADERS



Write For Our NEW CATALOG Number 33

403 Salliotte St., ECORSE, MICH.

The New South Bend back-geared screw cutting Lathes are used in leading manufacturing plants and machine shops for work requiring the highest accuracy and precision in production and tool work.

Write for general Catalog No. 96 giving details and full specifications. Sent Free Postpaid.

SOUTH BEND LATHE WORKS

768 E. Madison St., South Bend, Ind., U. S. A.

PRICES OF OTHER POPULAR SIZES

Size and Type Lathe	Between Centers	Ship'g Weight	Less C'shaft	Motor Drive
9"x3' Workshop Bench Lathe....	17"	320	$ 85.00	$116.00
9"x3' Junior Lathe	16⅜"	600	192.00	294.00
9"x3' Standard Change Gear.....	16⅜"	655	257.00	359.00
9"x3' Quick Change Gear.....	16⅜"	655	297.00	399.00
11"x4' Standard Change Gear.....	24"	920	339.00	487.00
11"x5' Quick Change Gear.....	36"	990	408.00	556.00
13"x4' Quick Change Gear.....	16"	1410	443.00	636.00
15"x5' Quick Change Gear	24½"	1460	529.00	769.00
16"x6' Quick Change Gear.....	34"	2230	626.00	869.00

SOUTH BEND *Precision* LATHES

YOU CAN COUNT ON HASKINS EQUIPMENT

Grinding? Cleaning? Polishing? Wire Brushing? They're all just part of the day's work. Light and portable . . . easily adapted for many different uses . . . quickly changed over from one operation to another . . . flexible shaft machines of amazing utility that cut operating costs and increase plant efficiency.

In scores of industries Haskins flexible shaft equipment is effecting huge economies and stepping up production . . . It may do the same in *your* plant. Why not investigate? Write today for illustrated booklet showing many different adaptions and actual operation pictures.

R. G. HASKINS COMPANY

4654 W. FULTON ST. CHICAGO, ILL.

Haskins

FLEXIBLE SHAFT EQUIPMENT

with Greater Adaptability

Your New Copy is Here

Showing an exceptionally complete line of linear precision instruments. New information, new dial indicators, new model numbers, new dial gauges, are all in the new Federal Catalog.

ASK FOR CATALOG No. 43

FEDERAL PRODUCTS CORP.

1144 EDDY STREET, PROVIDENCE, R. I.

Detroit . Chicago . Muncie . Cleveland . New York

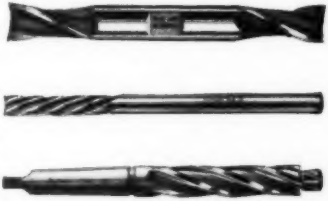
PUTNAM SPECIAL TOOLS

OUR staff of engineers, with years of specialized experience in the designing and production of high speed, quality cutting tools, is always at your service. If you have a complicated cutting problem that is so involved that standard cutting tools are out of the question—take up the matter with us.

We are certain that our engineers will be able to help solve your problem, and, of course, there is no obligation on your part. Furthermore, you are assured of the same quality, design and workmanship that have made Putnam Hi-Speed Tools a standard for accurate and economical performance.

STANDARD

PUTNAM TOOLS



Write for our catalog No. 3 —30 pages of valuable information on PUTNAM'S complete line of fine precision tools, including several important new money saving tools that deserve your careful consideration.

THE PUTNAM TOOL CO.

2961 Charlevoix Ave.

DETROIT, MICHIGAN

TAPPING FOR

● **NOTE**— *This illustration shows the new Procunier No. 1 Style 'E' high speed precision tapping attachment equipped with the new "TRU-GRIP" tap holder—Price $35.00.*

HERE IS THE NEW PROCUNIER "TRU-GRIP" TAP HOLDER

THE MOST SENSIBLE TAP HOLDER THAT EVER GRIPPED A TAP

SEND FOR BULLETIN 436

ATTACHMENTS PRECISION TAPPING

Precision tapping, like other precision work, requires a precision-made tapper. But you won't need an old, experienced operator to secure precision tapping with the new "Procunier" style "E" high speed tapper. This superior tapping head takes the guess work out of your tapping jobs, makes precision tapping easy, and makes your taps last longer.

A PRECISION-MADE TAPPER IS BOUND TO GIVE YOU BETTER SERVICE AND GREATER ACCURACY

"Procunier" style "E" high speed tappers are precision made from the bottom of the revolutionizing new TRU-GRIP tap holder to the top of the Morse Taper shank. Use the new style "E" and forget tapping worries.

PROCUNIER SAFETY CHUCK CO.

14 So. Clinton St., CHICAGO, ILL.

NICHOLSON
EXPANDING MANDRELS

They act as internal chucks for holding work while being machined on lathes, millers, grinders or shapers. Made in 14 different sizes taking bores of every fractional part of an inch from ½" to 7". Sold singly or in sets. Write for Bulletin 530.

CONTROL VALVES
2, 3 and 4 Way Types

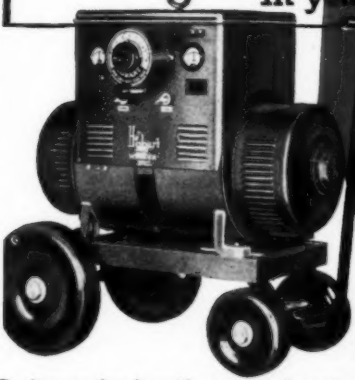
For operating air, water, steam or oil, single and double acting cylinders. Made in lever, foot, solenoid and motor operated styles for pressures up to 300 lbs. Hydraulic Valves up to 5000 lbs.

Bulletin on Request

Other Products—Arbor Presses, Flexible Couplings, Steam Traps, Steam Separators, Steel and Stainless Steel Floats, etc.

W. H. Nicholson & Company
117 Oregon Street, Wilkes-Barre, Pa.

This New 40 Volt Arc Welding will save hundreds of dollars in your plant



30 DAYS TRIAL in your shop at our risk **PROVES** its your biggest money-making tool

It's Easy to Own

Don't go another day without getting facts about this amazing new which cuts costs squarely in two in pattern work, tool room, main tenance, production, salvage.

THE NEW HOBART 40 VOLT "SIMPLIFIED" ARC WELDER

which comes to you on 30 days trial—which has features many others leave off—which costs you less to operate—which handles either plain or coated rod with ease. The coupon below brings complete details. Hobart Bros., Box TB-37, Troy, Ohio. One of the world's largest business of arc welders.

HOBART

THE FASTEST SELLING WELDER ON THE MARKET

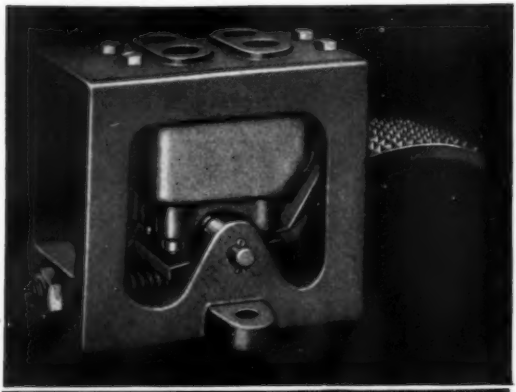
Hobart Bros., Box TB-37, Troy, Ohio

Gentlemen: Please send me, without obligation, complete details on the new Hobart 40 Volt Arc Welder for use in

Also the complete catalog.

Name

Address



ROSS Operating Valves

MODEL ST

Four-Way, Foot Controlled, Non-Locking Type

for the control of single and double acting cylinders

Made also in hand, mechanical and solenoid controlled types. All parts interchangeable between different models in like sizes—that means small inventory of spare parts.

Write for new catalog.

Ross Operating Valve Company

6484 Epworth Blvd., Detroit, Mich.

—A line of "QUALITY" PRODUCTS

Milling Machines

Grinding Machines

Screw Machines

Machinists' Tools

Cutters and Hobs

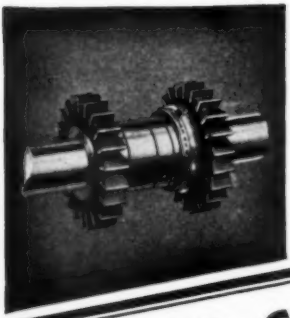
Pumps

Misc. Shop Equip.

B·S

Have you our general catalog No. 140? A copy gladly sent on request. Brown & Sharpe Mfg. Co., Providence, R. I., U. S. A.

BROWN & SHARPE



FOR ALL MAKES OF MACHINES

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Adjustable
and
Solid

SPACING COLLARS

Adjustable Spacing Collars

For straddle milling, gang milling and multiple slotting set-ups. They eliminate the use of shims.

Solid Spacing Collars

Are standard .001" to 3" thick. Less than 1/8" are not hardened.

Write for catalog of Scully-Jones equipment.

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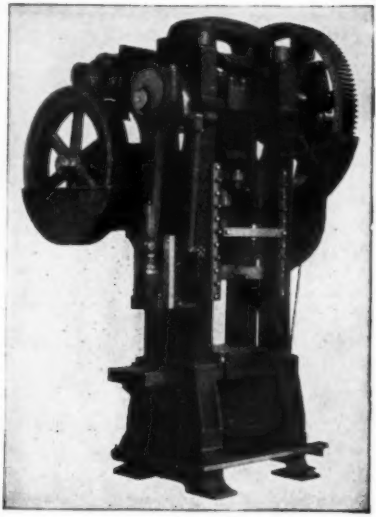
SCULLY-JONES and COMPANY
1905 S. Rockwell St., CHICAGO, ILLINOIS



ROCKFORD

INCLINABLE AND STRAIGHT SIDE PRESSES

● Rockford Presses are sturdily built of the best materials and incorporate many features that are the result of years of experience in building presses of various types. You can depend upon a Rockford—for it is designed to maintain exact adjustment throughout long runs and under heavy duty.

Write for Catalog.

ROCKFORD IRON WORKS
ROCKFORD, ILLINOIS

THE NEW LENNEY
VARIABLE SPEED TRANSMISSION

Gives you infinite speed adjustable to a fraction of a revolution per minute with reduction from 2 2/5 to 1 to 8 to 1. The Lenney Automatic Loading Device prevents slippage. Speed is constant even under severe overload. Neat in appearance with quality construction—built for long life without attention. Can be set to any speed while running or idle.

Investigate this unit—it may be the solution to your transmission problem.

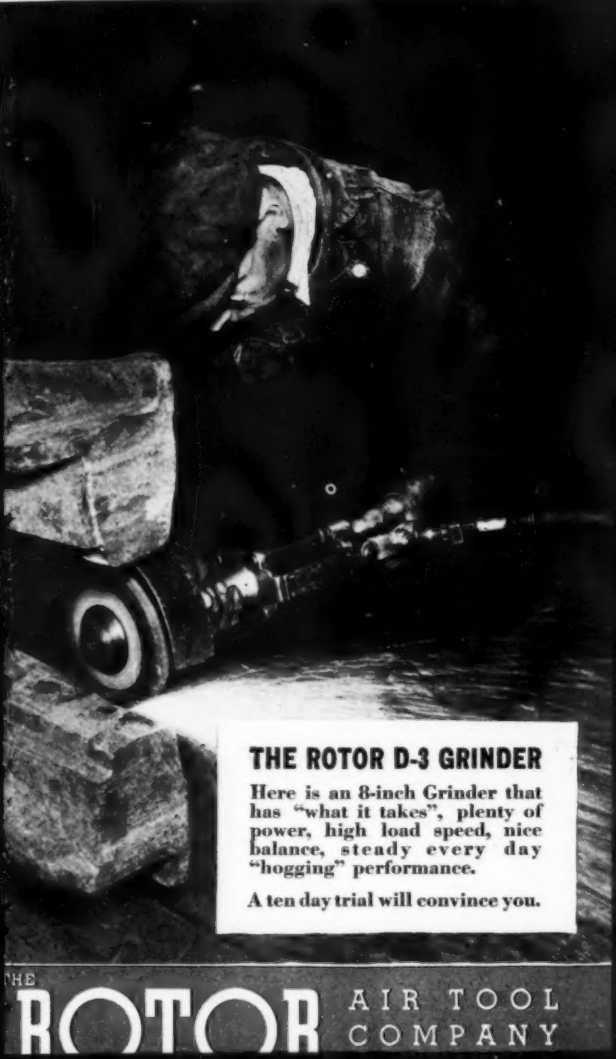
Built in Motorized and Unit Types from ⅙ to 5 H. P.

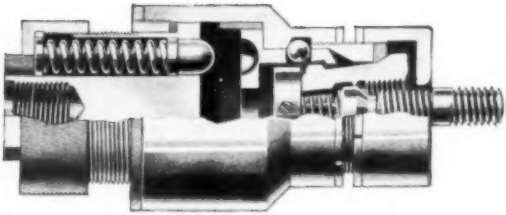
Territories available to agents of proved ability.

Write for New 1937 Catalogue

The LENNEY MACHINE & MFG. CO.

WARREN - - - OHIO


THE ROTOR D-3 GRINDER
Here is an 8-inch Grinder that has "what it takes", plenty of power, high load speed, nice balance, steady every day "hogging" performance.
A ten day trial will convince you.
THE ROTOR AIR TOOL COMPANY



TITAN STUD SETTER

Sets Studs to a Uniform Degree of Tightness without Strained or Mutilated Threads

The Titan Stud Setter is a new controlled drive type for driving stud bolts, being full automatic in loading and releasing. It is a power-driven unit adaptable to all types of drill presses, air or electric tools, both portable and stationary. Operates at high or low speeds. Positive in driving and automatic in releasing. Studs may be set to any predetermined degree of tightness.

The possibilities of increased production with this tool, due to its capacity, speed range and service, plus the added economy that its safety features assure by automatic operation—all contribute toward making it a tool worthy of investigation and profitable to use.

Write for Illustrated Circular

TITAN TOOL COMPANY

TITAN TOOLS

FAIRVIEW, PENNA., U. S. A.

The Progressive Portable Hydraulic Spot Welding Gun

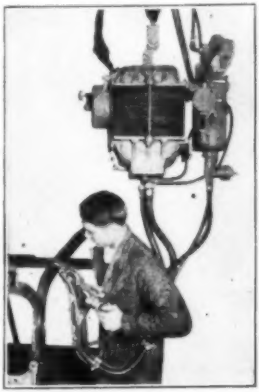
★ The Only Portable Hydraulic Spot Welding Gun - - - - ★
★ Only Hydraulic Operation Gives "Squeeze Action" Perfect Welds ★
★ Only Hydraulic Action Welds The Same Or Different Gauges ★
★ Hydraulic System Makes Smallest Gun With Maximum Pressure ★
★ Compact, Light Weight, Flexible, Water-Cooled, Rugged Construction ★

PROGRESSIVE WELDER CO.
735 PIQUETTE **DETROIT, MICH.**

Progressive Hydraulic Spot Welding Gun

The Progressive Welder Company, 735 Piquette Ave., Detroit, Mich., announce their new hydraulic spot welding gun, a portable unit for assembling sheet metal parts.

The principle of hydraulic actuation, new in portable spot welding, has many advantages over other methods, it is claimed. The "squeeze action" of the hydraulic welder gives a complete fusion of parts as compared with the hammer type of pressure obtained with pneumatic or mechanical means. The hydraulic welder is also self-lubricating.



The complete unit is readily installed on the production line, since only connections to air, water and electrical supply are necessary. Overhead mounting on a swjvel type hanger gives a working radius of approximately 12 feet. The hydraulic booster, the heart of the unit, is ruggedly constructed, self-lubricated, and capable of a range of pressures from 0 to 3000 lbs. The finger tip control for varying this pressure insures the correct pressure for all working conditions. Electrical current control is made by the latest timing devices. The elimination of the human element in spot welding has been the goal of the industry and this completely automatic equipment apparently leaves nothing to chance.

Three types of guns are available with this unit, and a wide variety of points, adaptors and yokes will accommodate almost any shape or section. The pincer, expansion and fixture bar type of hand guns cover every field of operation and with interchangeable points and fittings, can be adapted to any production or manufacturing change. Operation is so simple that the positioning of the gun points and pressing the operating button is all that is necessary.

DO IT—

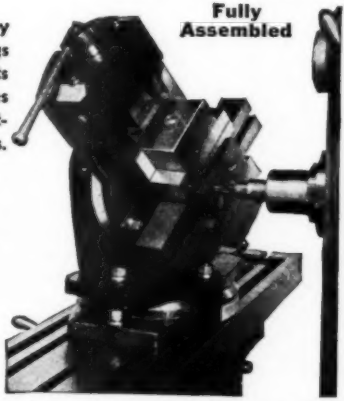
Better—Faster—for Less!

with ODIN UNIVERSAL

Precision Vises
Swivel and Plain

with Interchangeable Jaws and Hardened and Ground Parallels

Fully Assembled



They quickly pay their costs in savings on High Tool Costs —Expensive Fixtures —Patterns and castings—Extra Set-Ups.

Investigate the money saving possibilities of ODIN VISES

Write today for full facts and prices.

Let us show you how to make cheaper and better jigs and fixtures at a greatly reduced cost—with a great saving in time.

ODIN UNIVERSAL CORPORATION

CHICAGO

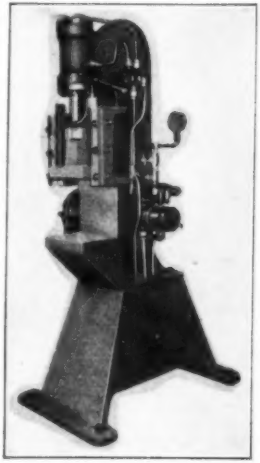
Sales Division
110 S. Dearborn st.,

Telephone
Franklin 3281

No. 57 Greenerd Hydraulic Press

The Greenerd Arbor Press Co., of Nashua, New Hampshire, is placing on the market a new 6 ton hydraulic press, punch press type, known as the No. 57.

This press, unlike the punch press, may be stopped at any point of the stroke in either direction at the will of the operator, by hand lever. Controlled, even pressure may be held on work indefinitely without injury to press. The No. 57 press is cast of special hydraulic semi-steel and equipped with steel piston and 3 cast iron rings and is sealed with chevron type packings. Ram is alloy steel, heat treated and ground. 3 h.p. motor and pump are mounted on opposite sides of the main housing. The pump is connected between a 20 gallon sump in the base and the control valve, which is operated by hand. At the top of the cross head is a knock out adjustment that controls the length of return stroke. The ram is controlled down or up by hand lever, that is, lever must be tripped each way by hand.



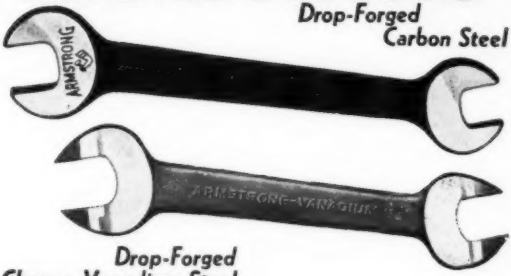
Pressure may be adjusted from ½ to 6 tons on down stroke and there is a 3 ton pull on up stroke. Ram speed down is 240 inches per minute, up 336 inches per minute. Working table is 12 inches wide by 8 inches deep and will receive diameters up to 10 inches.

The press may be modified to meet special requirements. Complete information may be obtained by writing to the manufacturer and asking for bulletin No. 61.

ARMSTRONG

TRADE MARK REG. IN U.S. PAT. OFFICE

Drop-Forged
Carbon Steel



Drop-Forged
Chrome-Vanadium Steel

Only ARMSTRONG has the Drivelock. The Drivelock (exclusive ARMSTRONG feature) takes the wobble, uncertainty and "makeshift" out of Detachable Head Socket Wrenches-brings these convenient wrenches up to industrial quality tool standards. A quarter turn of the ARMSTRONG Drivelock pin locks sockets to drivers, locks extension to extension, locks driver to ratchets—makes each assembly a safe, RIGID tool. Sockets cannot fall or pry off. Section cannot separate.

STANDARDIZE on ARMSTRONG WRENCHES for only ARMSTRONG can give the finest carbon steel wrenches, the finest Chrome-Vanadium Wrenches, and Socket Wrenches with the Drivelock - - - can supply *all* sizes, *all* types, and *all* essential features.

Write for Wrench Catalogs

Armstrong Bros. Tool Co.

"The Tool Holder People"

308 No. Francisco Ave. CHICAGO, U.S.A.

Eastern Warehouse and Sales: 119 Lafayette St., New York, N. Y.

SAN FRANCISCO LONDON

"Eklind" Universal Milling, Drilling and Boring Head

The Universal High Speed Tool Company, 549 Washington Blvd., Chicago, Ill., announce the Model 4H "Eklind" universal milling, drilling and boring head, a companion tool of their Model 2H "Eklind" universal high speed milling head.

This 4H unit, in addition to having the high speeds for efficient end-milling, has a four-inch vertical feed. Its fine precision makes it suited for spotting, drilling and boring holes in the layouts of dies and jigs. The head is mounted on the overarm of any horizontal milling machine and is motor driven, supplying spindle speeds through a V belt drive of 250, 400, 700, 1100, 2100 and 4000 r.p.m. by means of a six stepped cone pulley. This extreme range provides for 1/16-inch end mills as well as adjustable boring bars up to 1¼-inches. Collet capacity is ½-inch. Spindle is mounted in double preloaded ball bearings, 12-inches apart, with driving pulley mounted on its own bearings to eliminate strain on the splined spindle.

The 4-inch vertical travel of the quill is motivated by either a worm feed or lever operated rack feed. There are double compensating springs counterbalancing the weight of the quill so that sensitivity is obtained. The depth of quill travel is controlled by an accurate micrometer depth stop which is graduated in thousandths and locked at any point by tightening a collar which acts with pressure radially, thus

(Continued on Page 42)

INTRODUCING THE

NEW SLOW-SPEED

HIGH TORQUE

SKILSAW

ELECTRIC DRILLS

● Built especially for drilling in steels of high nickel content, such as Monel and Allegheny metals, stainless steel, etc. Both models available in speeds of 350, 450, 600 and 750 R. P. M. — can't be stalled even at top drilling speed!

These new SLOW-SPEED Skilsaw Drills lengthen the life of twist-drills, eliminating the need for frequent sharpening. The ½ in. model is new in design for a drill of this capacity. Its one-hand grip feature makes it ideal for close quarter work and for use with hole saws in places impossible to reach with side-handle drills. Both models especially adaptable to wood boring.

See Your Distributor or Write for Our Complete Catalog

SKILSAW, INC.

3504 ELSTON AVE. — CHICAGO

250 E. 43rd St., New York — 21 Brookline Ave., Boston — 111 Grove Ave., Los Angeles

the stop is not forced up or down as is the case with lock nut arrangements.

When it is desired to do milling operations the quill is locked by clamping the housing which is split at the lower end. Extreme care has been taken with the quill to insure a perfect working fit with take-up for wear provided. The Model 4H has proven invaluable on many production jobs requiring angular milling or drilling, or both. For complete details write the manufacturer direct.

First Aid to Water-Logged Electric Tools

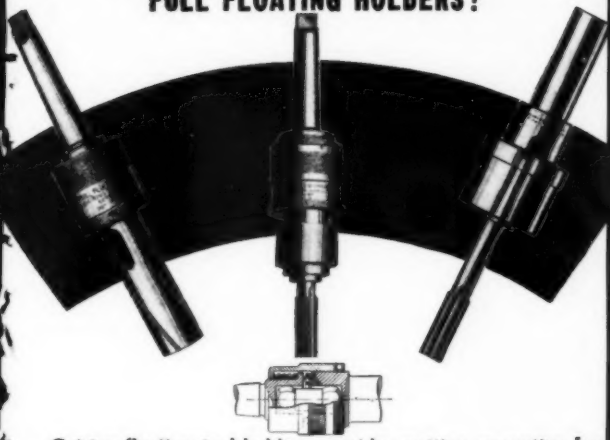
Mr. John S. Hand, service manager of the Black & Decker Mfg. Co., Towson, Md., offers the following suggestions to electric tool users whose equipment may have been under water during the recent floods in many areas in the Middle West.

Submersion has probably ruined the insulation in the tools as well as rendering the fibre parts unfit for use. Grease has become diluted and dirty and all parts covered with silt and mud. Do not operate electric tools, motors or switch mechanisms until they have been taken down, cleaned and baked out. For best results, send the tools to the nearest factory service branch for overhaul by trained men. But if the owner wishes to service the tool himself, the following procedure is suggested:

(1)—Completely disassemble the tool, to get at all parts (2)—The armature and field should be put into an oven and baked for twenty-four hours at a temperature of 275 degrees Fahrenheit (3)—They should then be checked for shorts and grounds. If O.K., apply a coat of insulating compound and bake again for twelve hours at 275 degrees (4)—All fibre switch and brush riggings should be replaced. Most switches will have to be replaced and all taped wire connections should be cleaned and retaped (5)—Clean all ventilating holes in the case of the tool (6)—Wash all grease from all gears, housings and bearings, using a suitable fluid. Repack with new lubricant, using a good grade of medium cup grease, such as "Non-Fluid Oil A No. 3" or equal (7)—Clean rust and dirt from all parts.

These instructions apply to electric grinders (portable and bench), sanders, polishers, drills, screwdrivers, hammers, heat guns, saws, valve refacers and most types of motor driven electric tools.

HAVE YOU CONSIDERED THE SIGNIFICANCE OF FULL FLOATING HOLDERS?



Gairing floating tool holders provide positive correction for mis-alignment.

Accurate work depends more upon the holder and cutting tool assemblies being in perfect alignment with the fixture without deflection from the machine spindle than on any other factor.

They are used—where the spindles are out of line with the bushing plate—where the bushings or tool holders receive excessive wear—where the spindles of the machine are indexed—where the fixture is indexed.

Gairing floating holders are used in the spindles of new machines by machine manufacturers and have lengthened the life of innumerable machines and fixtures because they are self-aligning.

Don't gamble on future performances. Specify Gairing full floating holders for the spindles of your equipment and receive the utmost in efficiency and economy in operation.

Manufacturers of

STANDARD and SPECIAL CUTTING TOOLS and TOOL HOLDERS

Counterbores and Countersinks . . . Counterbore Sets, Spotfacers . . . Core Drills, Reamers, Hollow Mills . . . Full Floating Holders, Facing Heads . . . Form Cutters, Boring Bars, Boring Heads . . . Adjustable Extension Holders . . . Multi-Diameter Cutters . . . Tungsten Carbide Tipped Tools

Catalogs will be sent on request. Representatives in principal cities.

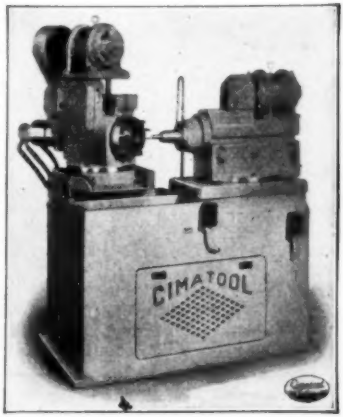
THE GAIRING TOOL CO

[illegible] DE WEST LAFAYETTE DETROIT MICHIGAN

New Cimatool High Speed Gear Chamfering Machine

The Cimatool Company, East Third at June Street, Dayton, Ohio, announces a new high speed gear chamfering machine available in three different models and providing production speeds on chamfering and burring ranging as high as 600 teeth per minute. The three types are known as models 4-A, 4-B and 4-C, available for either air, hydraulic or manual operation.

The 4-A, shown in the illustration, is the smallest type, comprising a single work head and single cutter spindle in one base. The 4-B model has a single work head with two cutter spindles, both designed to simultaneously machine a single part. The 4-C comprises two 4-A machines in a single base, or two complete single spindle machines in one base. On the 4-A the teeth on one face of the gear can be chamfered.



On the 4-B, inner and outer faces of a ring or bevel gear may be chamfered simultaneously or the two cutter spindles may machine similar gear teeth on the same face of the gear from opposite sides of the gear, so that a half revolution of the part will accomplish the complete chamfering of one face of the gear.

The 4-C model, combining two of the single spindle machines, enables one operator to load one part on one work head while the other half of the machine

(Continued on Page 46)

MARSCHKE

Formerly Van Dorn, Black & Decker

HEAVY DUTY GRINDERS AND BUFFERS

You know what a man means when he describes a job as "A DIRTY DAILY GRIND," but have you stopped to think that the term probably developed from observing ordinary services of Floor Stands, Swing Frame Grinders, Buffers and similar machinery?

You need a good machine for that kind of work. It must have "heft" but it must also have refinements of design for *convenience and safety of operation* and exacting execution of that design to exclude the dirt from motors and bearings.

That is one of the reasons for standardizing on MARSCHKE GRINDERS and BUFFERS—formerly made by Van Dorn, Black & Decker—now being manufactured and sold by

VONNEGUT MOULDER CORP.

1805 Madison Avenue Indianapolis, Ind.

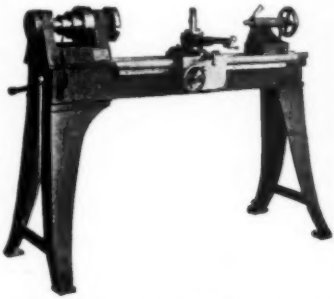
A Catalog with seventy different Grinder and Buffer specifications will be sent promptly upon receipt of your request.

is operating on another part, or two different gears may be handled by the same operator.

The work cycle may be completely hand operated, or optional at extra cost, a completely automatic cycle is obtainable. In the latter case a time mechanism is furnished, enabling the operator to press a button which automatically actuates clamping of the work, the quick traversing of the cutter spindle to the cutting position, the indexing of the part, and its presentation of the cutter by the work head, the receding of the cutting head to the loading position upon completion of the machining of the part, the automatic shut-off of the machine operation, and the releasing of the work by the clamping adapter.

New "Oliver" 12-inch Speed Lathe

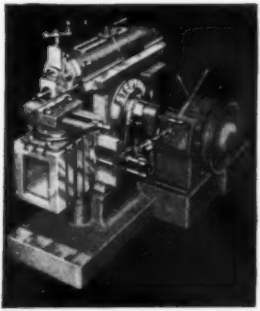
The Oliver Machinery Company, Grand Rapids, Mich., announce a new motor-in-head, "V" belt driven speed lathe designed to meet the demand for accuracy and general utility in the metal working industry. All parts are jig machined, whether large or small, and fitted to templates, thus assuring interchangeability of parts and accuracy.



The lathe will swing 12 inches diameter over the bed or 9½ inches over the carriage and will turn 36 inches long between centers on a bed 60 inches long. Belt driven headstock is 12¼ inches long, 10½ inches wide. Bearings on belt driven lathe are fitted with adjustable split bronze bushings grooved inside for oil passage, and ring-oiling from ample oil wells having

(Continued on Page 48)

POWERFUL MACHINES
for HEAVY WORK

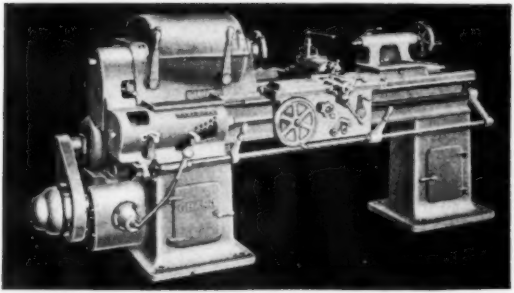


STEPTOE SHAPERS

Force feed continuous lubrication, heavy construction and Timken bearings throughout insure rigidity, accuracy and long life. Centralized controls are within easy reach of the operator at all times.

Instantaneous feed and speed changes may be made with fingertip control while the machine is running.

Send today for catalog No. 130.



CHARD Twelve-Speed All Geared Lathes

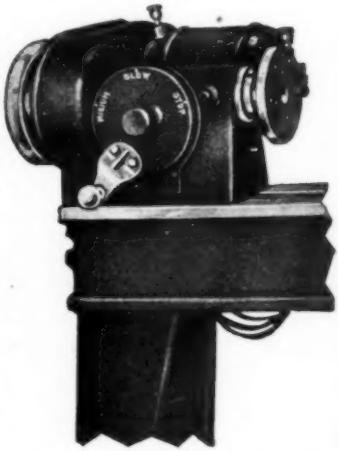
Precision Timken or plain bearing spindle—Instantaneous start or stop of spindle—12 speed changes in 15 seconds—Heat treated and hardened gears run in oil in speed box—All shafts mounted on ball bearings—Powerful, accurate, and easy control—Built in 16", 18" and 20" standard engine lathes, manufacturing lathes and tool room lathes. ● *Send today for full information.*

Western Machine Tool Works

HOLLAND, :-: :-: MICHIGAN

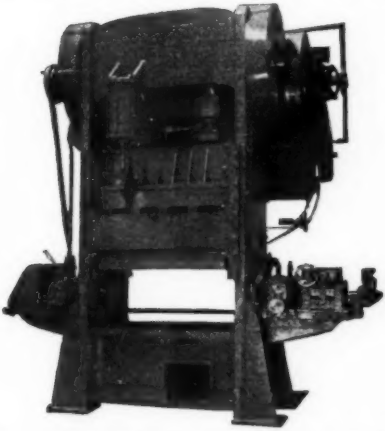
both level and drain plugs. On motor headstock ball bearings are used.

End thrust is cared for by the ends of the cone pulley pressing against the bronze bushings. Adjustment is made by expanding the cone, the smallest step being threaded in the balance of the cone. Spindle has Parsons white bronze ring-oiling bearings (3 inches long) that are adjustable to wear. These are non-heating and require oil about once a month. Spindle is 15 inches long, 1½ inch diameter in front bearing, 1⅜ inch diameter in rear bearing, has regularly a ⅝ inch hole its entire length (larger holes to order) bored for No. 2 Morse taper. Cone has four steps, 6½ inch, 4 13/16 inch, 4 1/16 inch, 3⅝ inch diameter, 1¾ inch face, giving 700, 1195, 1920 and 2800 r.p.m. Tailstock is of open side design 7 inches long, 6 inches wide, secured to bed with positive clamp. Spindle is machine ground steel 1¼ inch diameter, 8 inches long, bored for No. 2 Morse taper. Spindle has traverse of 4 inches. Bed is a cored casting 6¼ inches deep, 6¾ inches wide and regularly 60 inches long.



Lathe can be furnished in four styles: belt driven as shown in first illustration; with motor-in-head drive as shown in second illustration; with motor mounted on bracket below machine; or with plain bed only, carriage with compound swivel rest being omitted.

Trade Verson Mark ALLSTEEL POWER PRESSES



ALL SIZES — ALL TYPES

Capacities 1 to 4500 tons

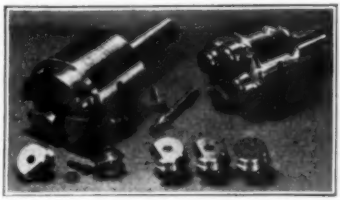
This is a straight side, double crank press equipped with double roll automatic feed with ball bearing straightener and eccentric scrap cutter. Has three sets of air cushions in the ram which can be positioned for different dies. Operates between 20 and 80 strokes per minute. Used in automatic blanking and forming on as many as eight successive operations at each stroke. Built in any size from 10 to 2000 ton capacity.

Send for catalog of Verson Power Presses.

The Allsteel Press Company, Inc.
12017 S. Peoria St., Chicago, Ill.

New National Acme Hollow-End Milling Tool

The National Acme Company, 170 East 131st St., Cleveland, Ohio, announces a new hollow-end milling tool.



This tool is designed to use circular cutters with the same micrometric adjustment and positive locking feature as is used in holding circular chasers. By using more than one step on the cutters, it is possible to turn several diameters with one pass. After the tool has completed the cut, the cutters are automatically released and backed off, without marring the work.

Adjusment for diameter is provided in the tool. The cutters are sharpened much the same as ordinary cutters, but are set after sharpening by means of a micrometer gauge to insure even distribution of the cut. This method of hollow milling enables the operator to resume work with a minimum of downtime. Cutters may also be used for facing or turning a radius on a shoulder, if desired.

The tool holder may also be used as a standard self-opening automatic die head by simply changing from hollow milling cutters to circular chasers. In this way, either milling cutters, circular chasers, or a combination of both may be used in these tool heads. Diameters from .056" to 13⅜" may be end-turned in this manner with standard cutters.

The Ross Operating Valve Company, 6488 Epworth Boulevard, Detroit, Michigan, has just issued catalog No. 36, fully illustrating and describing their line of operating valves used on machinery of various types. Included are photographs of actual installations as well as detailed blueprints of each model. A copy will be sent on request to those interested.

FEDERAL Heavy Duty Open Back Inclinable PRESSES

"Built for Service"

No. 5 Flywheel Type
Capacity 50 Tons.

★ **Efficient**

★ **Dependable**

★ **Accurate**

★ **Safe**

All models of FEDERAL Presses are equipped with Timken bearings to increase efficiency and production at the lowest possible upkeep cost. Clutches are equipped with a positive locking device for die setting or adjustment and a device which makes it impossible for the press to repeat when momentum carries the crankshaft beyond center. This non-repeat safety feature reduces the danger of accidents to operator or dies.

Write today for information on the FEDERAL Press line.

FEDERAL PRESS CO.

ELKHART, INDIANA

New Knock-Out Keyless Drill Chuck

K. O. Lee & Son Co., Aberdeen, South Dakota, announce a new keyless drill chuck, designed for modern heavy duty, precision and high speed drilling work.

This new chuck has six distinct features: (1)—Slip-proof; all spoilage and chewing of drill shanks is eliminated. The work load automatically tightens the grip in proportion to the resistance encountered. (2)—Keyless; no tools, wrenches or keys are required for operation. A slight finger tip twist of the feed screw cap is sufficient to grip the drill as the chuck is self energizing. (3)—Accurate; the design of the jaws and cone provides permanent and positive alignment. All parts contributing to accuracy, strength and durability are hardened and finished ground. (4)—Unlimited durability; simplicity of design, rugged construction with few working parts permanently lubricated make for long life. (5)—Fast action; heavy feed screw with steep pitch and square cut threads requires only a few turns of cap for full range. (6)—Ball bearing; free action and easy release are assured even after the severest heavy duty drilling.

These chucks are adaptable to all types of drilling equipment. Five sizes are now in production: 0-¼" 0-⅜"; 0-½"; 3/16-⅝"; and ¼-⅞". For additional information write K. O. Lee & Son Co.

Carboloy Company, Inc., 2985 East Jefferson Avenue, Detroit, Michigan, announce the publication of a new grinding chart. This 18x12 wall chart presents, in condensed form, the most efficient methods for grinding single point Carboloy tools. It contains recommendations on grinding wheels, diamond wheels, diamond lapping discs, wheel speeds, rough and finish grinding procedure and methods for hogging off stock rapidly. Copies of this chart, No. GC-71, may be obtained by writing directly to the Carboloy Company at the above address.

WITTEK
AUTOMATIC
Roll Feeds
For Every Size and Make of Punch Press

FAST
ACCURATE
AUTOMATIC
SAFE

Increases Punch Press Production

Keeps production at the same steady high level day in and day out—no fatigue or other human "let down". Easily installed on any press without alteration. Feeds automatically any stock from coils in lengths from 0" to 24" per press stroke. Saves time, operating costs and dies—reduces scrap to a minimum. A type for every requirement—Single Roll, Double Roll, and Compound with straightener.

Wittek Reel Stands

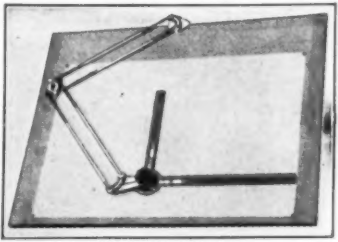
Automatic, Self-Centering, Ball-Bearing. Adjustable to any height, balanced at any angle, 500 lb. capacity. Prompt deliveries from stock. Also made in four other models.

Write Today for Bulletin "HF" giving complete details and specifications of WITTEK Automatic Roll Feeds and Reel Stands.

WITTEK MANUFACTURING COMPANY
4305-9 W. 24TH PLACE. . . . . CHICAGO, ILL.

New Wrigraph Drafting Machine

A drafting machine of a new and larger type, with greater accuracy and very rugged construction, is being sold through the Wrigraph Sales Division of L. G. Wright, Inc., 5207-5209 Euclid Avenue, Cleveland, Ohio.



The new model R-300 Wrigraph illustrated, is a precision instrument that will easily make drawings up to 28"x38". A mounting clamp holds the machine onto any drawing board, the machine itself is self leveling. The permanently calibrated parallel mechanism guarantees the highest accuracy and dependability. It is assembled with eight special Fafnir precision ball bearings, prelubricated and sealed at the factory. Aluminum alloy castings are used and all parts are given a dull satin finish to prevent glare. The indicating protractor is of a new type with which one degree angles can be obtained in one simple operation. The protractor may be clamped rigidly against rotation and an automatic stop makes it possible to return the protractor to the zero position. Scales are made of duraluminum and readily interchangeable. Graduated drawing edges on the scales are made of the finest transparent pyralin. A scale chuck plate adjustment provides for perfect right-angle alignment.

The Wrigraph drafting machine is the only instrument of its kind which provides, through a very rugged clamping arrangement, a "no set zero" protractor head. Model R-300 has one 12" and one 18" scale, graduated 1/16". All standard architectural and engineering graduations are available.

New Hydraulic Cold Saw

For the rapid cutting of non-ferrous tubing and bars, the Cochrane-Bly Co., Rochester, New York, have re-

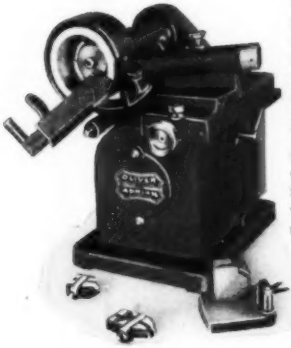
(Continued on Page 56)

• OLIVER •

PRECISION DRILL GRINDER

Protect Your Small Drill Investment

80% of all drills are small (3/8" or under) so you see it pays to use an 'OLIVER' No. 21 —a machine especially designed for small drill grinding—to keep them in perfect cutting condition.



The OLIVER is more than a motor-grinder-stand. It is a complete machine tool, designed and built to assure QUICK SETTING, ACCURACY, SPEED in grinding, HIGH EFFICIENCY AND UNIFORM drill points. It is being used by leaders everywhere in the manufacturing industries and with the greatest amount of success.

Let us tell you more about this SUPER machine for grinding small drills 3/32 to ½" in diameter.

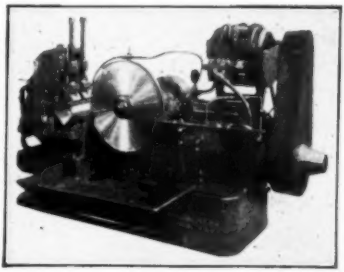
We also build the larger automatic types for drills 3/16" to 4¼".

Send for Oliver literature—No obligation.

OLIVER INSTRUMENT COMPANY

1408 E. MAUMEE ST. ADRIAN, MICHIGAN

cently brought out a new high speed machine having a four speed sliding gear transmission through hardened alloy steel gears, hardened steel worm, and phosphorus bronze worm gear running in oil, and all drive shafts including the saw spindle mounted in anti-friction bearings.



Remote control is provided for changing the saw speeds from 235 to 600 feet cutting speed per minute and the hydraulic feed is adjustable from 0 to 60" per minute. Machine has automatic trip and rapid return of carriage and rapid forward traverse of carriage. Adjustable stops regulate the travel of carriage to size of tube being cut. Machine has hydraulically operated vise with compound toggle link and vertical slide carrying adjustable clamp screws each side of saw blade. These screws are fitted with removable Vee or radius blocks to prevent distortion of thin walled tubing under clamping pressure.

An extended pan provides large storage space for chips and permits easy access of shovel for their removal. Tank for hydraulic oil is located under the base of machine and base provides a sump for drainage of cutting oil. Machine is motor driven through multiple V belts and has friction clutch for instant stopping and starting. The saw has capacity for tubes up to 8" in diameter and weighs approximately 5,000 lbs.

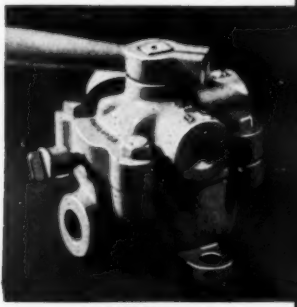
"Contour Sawing (And Filing)" is the title of a new hand book issued by Continental Machine Specialties, Inc., 1301 Washington Avenue, South Minneapolis, Minn. An attractive booklet of 112 pages, it shows various applications of their Doall saw and file, is liberally illustrated and has a thumb index.

NOPAK

3 and 4-Way Operating Valves

FOR AIR, WATER AND OIL

FOR OIL OR WATER



FOR AIR

Sturdy yet simple in construction, NOPAK Operating Valves offer long, efficient operation without maintenance cost, and with absolute freedom from leakage.

The NOPAK flat disc design provides advantageous port spacing, which insures positive, accurate control with both throttling or quick opening action, as desired.

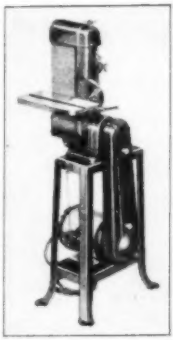
- ★ No Packing
- ★ No Maintenance
- ★ Leakproof
- ★ Protected Disc and Seat
- ★ Quick or throttling action, as desired

WRITE for Bulletin 65

GALLAND-HENNING
MANUFACTURING COMPANY
2753 South 31st Street Milwaukee, Wisconsin

New Delta Six-Inch Belt Surfacer

Designed to handle a wide range of sanding, surfacing and finishing operations, a new 6-inch belt surfacer recently marketed by the Delta Manufacturing Company, 631 E. Vienna Ave., Milwaukee, Wis., has many unique features.



It can be used as either a horizontal or vertical sanding machine for surfacing or shaping wood parts. When in the horizontal position it may be fitted with a wood fence and an adjustable back stop to guide and stop the work. In the vertical position it may be fitted with a tilting table that permits a wide variety of angular shaping and sanding. Its versatility enables it to be used not only in the finishing of metal parts with aluminous-oxide and silicon-carbide belts, but also in the surfacing and finishing of parts made of Bakelite, Catalin and other plastics, bone, tile, asbestos and many other materials.

The machine is completely equipped with self-sealed ball bearings, lubricated at the factory for their entire life. The drums carrying the sanding and finishing belts are designed to eliminate the necessity of rubber coverings which require frequent replacement. A distinguishing feature is the complete enclosure of every part of the belt and drive mechanism, which not only makes the machine conform to safety requirements, but also enables an efficient dust-collecting system to be added to it. It may be mounted on a steel stand to make it entirely self-contained.

Special Dies Developed By Wrought Washer

Improvements in design and building of punch press dies for producing difficult and intricate stampings are constantly being developed by the engineering staff of the Wrought Washer Mfg. Co., 2100 So. Bay St., Milwaukee, Wis. Emphasis is placed on developing

(Continued on Page 60)

END MILLS
for All Purposes

SHEAR CUT END MILLS

YOU will find an end mill for practically every job in the standard line of Progressive Shear Cut End Mills. They will give accurate, economical service due to the careful, constant attention given to the workmanship and material used in their manufacture.

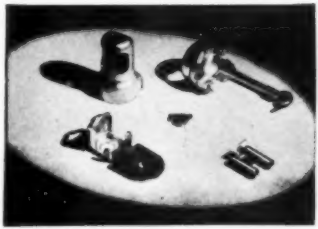
SEND us your blue prints on special end mills. Our many years of experience in the design and manufacture of standard Progressive products is always at your disposal without any obligation on your part. We guarantee that only the best of materials are used and the finest workmanship. We can quote very attractive prices and assure prompt delivery.

Write for a copy of the Progressive Catalog Today

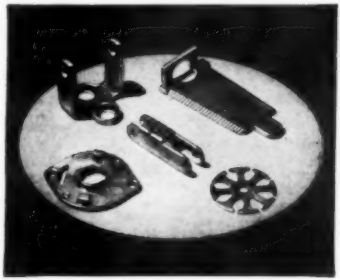
PROGRESSIVE TOOL & CUTTER CO.

FERNDALE, MICHIGAN

dies for high speed quantity production, producing stampings in one operation. Dies are progressive and fully automatic.

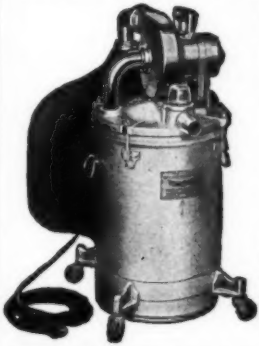


A number of representative samples of stampings produced are illustrated in the accompanying photographs. The scale shown in the first illustration (showing non-ferrous pieces) is approximately one-half actual size. That in the second illustration (showing steel pieces) is approximately one-third actual size. One of the stampings is made with a single operation die and is formed by bending the stock back upon itself 180 degrees and then finished so that the ends are open at an angle of exactly 3 degrees.



Another interesting example is a finished stamping in which 2 holes were previously being sunk on a drill press. A special progressive die was designed to perform the countersinking as an integral step in the stamping production and at the same time to produce a finished part with each stroke of the press—eliminating entirely the drill press operation. One of the steel stampings illustrated has serrated cutting edges formerly produced by means of a broaching process which required an additional finishing trim operation. Dies now produce this part complete in a single operation with the serrated edge finished perfectly flush as required.

For the First Time! Vacuum Cleaning Made Applicable to All Plant Cleaning Requirements at Low Cost With



Breuer's Ball Bearing

TORNADO

Portable Industrial Vacuum Cleaner

•

This new machine is designed to solve all industrial cleaning problems without the expense of installing a stationary plant or using so-called portable cleaners which are too heavy and expensive for average plant applications.

TREMENDOUS POWER

1 H. P. Motor—46¼ Waterlift

Do not confuse the TORNADO with light-duty cleaning machines. Model 112 combines light weight (only 40 pounds) with tremendous cleaning power (1 H. P. G. E. ball bearing Motor—46¼" waterlift). Patented principle of separating fine dust from refuse and depositing heavy dirt in tank makes this cleaner as applicable to heavy duty work as the largest machines. Sturdy construction insures long life and low yearly cost.

Has plenty of power and capacity to handle dust, dirt, sand, sawdust, metal scraps, filings, etc. Attachments available for cleaning boiler tubes, ovens, machinery, walls, floors, pipes, etc. Motor unit can be quickly removed for blowing dust from motors, etc. The handiest heavy duty, low cost, time and labor saving unit ever built.

We prove TORNADO advantages right in your plant without obligation. Send for details of trial offer and further information or write

BREUER ELECTRIC MFG. CO.

846 Blackhawk Street **Chicago, Illinois**

Skilsaw Floor Sander

A floor sander incorporating many new engineering features and designed and balanced to produce an expert finish for inexperienced operators, is announced by Skilsaw, Inc., 3310-20 Elston Ave., Chicago, Ill.

The unit weighs 138 lbs. Sufficient weight is provided to eliminate the necessity for manual control or addition of weights to keep drum in constant contact with surface of the work. A sanding motor with ample reserve power insures fast work on the toughest of jobs. The V-belt drive is quiet in operation with no loss of power in slippage. Motor is mounted on a sliding base so operator can quickly adjust to compensate for any slight belt stretch. Frame is one piece steel construction and there are no bolts, nuts or rivets to loosen and cause vibration. All parts are built to this frame, making for rigid construction throughout the unit. Sanding drum measures 7 inches wide by 6¾ inches in diameter and is covered with a resilient sponge rubber pad to prevent "pitting" of the floor. A patented vise-like grip, requiring no wedge, holds sandpaper to drum.

Another exclusive feature is the method of dust collecting, which is effected by use of a separate vacuum system mounted integral to the frame and independently motored. The dust intake aperture extends the

(Continued on Page 64)

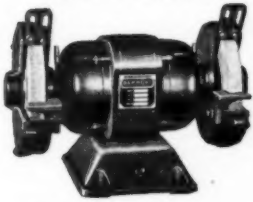
New Hammond Grinders

TYPE "W"

¼ - ⅓ - ½ & 1 H. P.

WITH

TOTALLY ENCLOSED MOTORS



THESE sturdy little ball-bearing bench grinders with totally-enclosed motors, are completely equipped as illustrated, ready to attach to power circuit. Pedestal (not shown) supplied at slight extra cost.

HIGH-GRADE, powerful one-horse, ball-bearing electric grinders, with totally enclosed motors, in both floor and bench types.

Priced as low as

$22.50

Pin this ad to your letterhead for Catalogs of the Complete Line of Hammond Grinders and Polishers up to 20 H.P. cap.

Address Dep't. 14

Hammond Machinery Builders INCORPORATED

KALAMAZOO, MICHIGAN, U. S. A.

Eastern Branch: 148 West 23rd Street, New York

length of the sanding belt and collects all the dust as it leaves the drum, both on forward and backward strokes. Handle of unit is adjustable for the comfort and convenience of the operator. Switch has 100% overload capacity and all moving parts are mounted on grease sealed ball bearings.

Compound Angle Magnetic Chuck

The Grinding Machinery Company, 2832 E. Grand Boulevard, Detroit, Mich., announce their new "Red Stripe" compound angle magnetic chuck, in senior and junior models. Designed for use on surface grinders, cutter grinders, drill presses, small milling machines and other types of machines, they are used for grinding tungsten carbide tools, circular form tools, lathe tools, crankshaft tools, thread chasers, sectional broaches and many others.

This chuck can also be used for grinding blocks or pieces square and will convert a cutter grinder into a surface grinding machine when needed, doing away with complicated fixtures. Tapped holes are provided in the top face of the chuck for clamping of non-magnetic work, straight or angular. Coils are carefully wound to secure highest magnetic efficiency and are thoroughly tested against defective workmanship. Cannot be affected by water or grinding compounds as chuck is waterproof.

In addition to the magnetic chuck there is a clamping vise furnished with each unit that will fit the base. In removing chuck from base all that is necessary is to remove nut and insert stud in the same hole and vise is ready to use. A "V" block can also be furnished to fit the base at small cost, having one "V" in the block which is 1½ inches wide. Block is 3 inches long, 2½ inches wide, with 90 degree angle, and can be set at any angle from each side of center. Complete details may be obtained directly from the Grinding Machinery Co.

The Medart Company, manufacturers of appliances for the mechanical transmission of power by belt, rope, gearing and steel shafting, has opened a district sales office in Room 1559, Dierks Bldg., Kansas City, Missouri. Mr. W. A. Crooks, an experienced power transmission engineer, will be in charge.

Your brand-new automatic screw machine is not completely modern unless it is equipped with . . . . .

Sutton DIAMOND GRIP Collets

Because they are DIAMOND-SERRATED, they grip tighter under less tension, cause less wear on both machine and collet, reduce spoilage.

Modernize by specifying "Sutton Only". Single-piece and master types for all makes of machines.

Send for Catalog No. 12 showing complete Sutton line of screw machine accessories

SUTTON TOOL CO., 2836 W. Grand Boulevard, DETROIT, MICHIGAN

Wiregrip Carded Belt Hooks

Armstrong-Bray & Company, 308-310 North Sheldon Ave., Chicago, Ill., are announcing a new line of Wiregrip carded belt hooks.

Wiregrip belt hooks are mounted on special processed cards (patent applied for) that hold the hooks firmly in the card, strengthening them and permitting the workman to easily cut off the desired number of hooks without disturbing or destroying others. According to the manufacturer, they are made of the finest wire available for the purpose and will stand long, continuous, hard usage. Wiregrip hooks may be applied with any standard lacer, or with a Wiregrip belt lacing machine.

Armstrong-Bray & Company also announce that their new catalog No. 10 is ready for distribution, showing their complete line of belt lacing, belt hooks, belt lacing machines, lacing and couplings for round belting and gear and wheel pullers.

Bulletin 3600-A1 describing the construction and operation of their Model 36 Diesel power units, has just been issued by Fairbanks, Morse & Co., 900 South Wabash Avenue, Chicago, Ill. Sectional views and illustrations of various units and their parts are included, as well as many photos of actual installations in portable or semi-mobile industrial and construction equipment.

The American Nickeloid Company, of Peru, Ill., are distributing two folders. One entitled "Electrical Devices" shows various manufactured products made from their bonded metals, together with a sample of chrome steel; the other is entitled "Crimped Coils" and describes their pre-crimped and prefinished metals which are available in flat sheets or coils.

DRILLING MACHINES

FORMERLY manufactured by Rockford Machine Tool Co., of Rockford, Ill.; thousands of these drills have been installed in plants the country over, where they have been giving universal satisfaction.

Counterbalanced, eight-speed spindle, made from high carbon special steel, has quick advance and return; positive feeds are instantly available while machine is in operation; all controls within easy reach.

14'-20'-21' Stationary Head

24'-28'-32' 36' Sliding Head

* * *

Belt or Motor Drive

Write for Complete Details

POWERFUL—SIMPLE—DURABLE—ACCURATE

We have been builders of Drilling Equipment for more than 20 years and, in addition to the above drills, manufacture the Cleereman Automatically Oiled, Anti-Friction, High Speed Drilling, Boring and Tapping Machines; Gang Drills and Special Drilling Machinery.

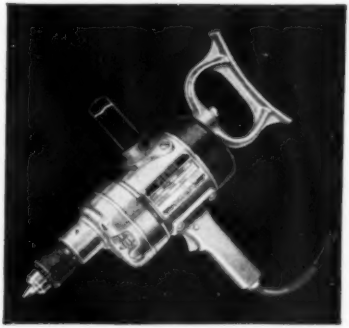
CLEEREMAN MACHINE TOOL CO.

GREEN BAY, WISCONSIN

(Formerly Green Bay Barker Machine Tool Works)

New Stanley "Victor" Drill No. 124

The Stanley Electric Tool Division, of the Stanley Works, New Britain, Conn., announce a new one-half inch capacity drill known as No. 124.



Designed to meet requirements of mechanics and others requiring an efficient drill for wood or metal drilling and for hole saw work, its features include specially heat treated nickel steel gears and a universal motor mounted on seal type ball bearings. Has strong aluminum alloy housing and a three-jaw chuck. Built-in pocket on housing holds chuck key securely where it can be located readily. Combination spade and breast plate handle and a pipe handle may be detached for working in close quarters. No-load chuck speed is 500 r.p.m. Length is 15½ inches, weight 12½ lbs.

One of the richest awards ever established for competition in the field of mechanical science has been announced by The James F. Lincoln Arc Welding Foundation. To stimulate intensive study of arc welding, $200,000 will be distributed by the Foundation among winners of 446 separate prizes for papers dealing with this subject as a primary process of manufacture, fabrication or construction in eleven major divisions of industry. The principal prize winner will receive not less than $13,700. Other prizes range from $7,500 to $100. The contest closes June 1, 1938, and prospective entrants should communicate promptly with the Foundation Secretary, Mr. A. F. Davis, P. O. Box 5728, Cleveland, Ohio, for complete details of the rules and conditions covering awards.

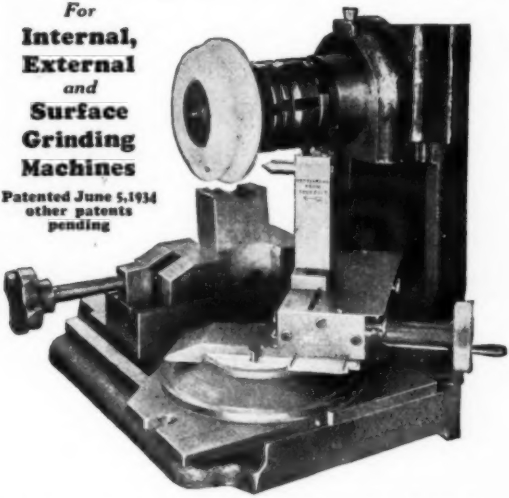
The VINCO

Angle Tangent to Radius Dresser

For

Internal, External *and* **Surface Grinding Machines**

Patented June 5,1934 other patents pending



This shows a Vinco Dresser in use on a surface grinder and also a form tool ground with a wheel formed with this dresser. The form on the tool consists of straight surfaces, angles and radii. All dimensions are held to close tolerances, angles and radii must be tangent. It is easy to dress forms like this on abrasive wheels, for the Vinco Dresser has the patented basic feature of dressing angles and radii from the same axis without moving the diamond, angles and radii are always accurate and tangent. The Vinco Dresser eliminates all worry and uncertainty in dressing angles and radii and saves 75% in dressing costs. It is precision made of the finest materials and guaranteed to be satisfactory.

SEND FOR DESCRIPTIVE CIRCULAR

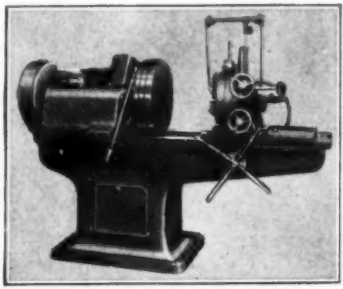
VINCO TOOL CO.

7348 Central Ave., Detroit, Mich.

New Landis 2" Pipe Threading and Cutting Machine

The Landis Machine Company, Inc., of Waynesboro, Pa., is offering a 2" pipe threading and cutting machine of improved design. The new machine is far more rigid and weighs slightly more than the machine it replaces, yet requires little more floor space.

The bed has been made heavier and stronger by increasing the thickness and number of the webs and ties. Ways are covered by steel guards attached to the cross rail and telescoping under the headstock in order to protect ways at all times.



The machine is equipped with an eight speed, built-in gear box with single pulley drive. When motor driven, motor is mounted on top of headstock and connected to main drive shaft by a silent chain drive. Chuck speeds are 30, 40, 52, 67, 72, 90, 125 and 163 r.p.m. Main drive shaft has speed of 425 r.p.m.

Capacity for threading pipe is from ½" to 2" inclusive with a carriage travel of 14". Belt driven machine weighs 2800 lbs. net, motor driven machine 3000 lbs. net. Literature fully illustrating and describing this new machine may be obtained by writing directly to the manufacturer.

The John Waldron Corporation of New Brunswick, New Jersey, have just issued an attractive bulletin on the new Francke fractional horse power flexible couplings. It describes and illustrates these modern couplings and provides diagrams of construction and other data. This bulletin and new price list will be sent upon request.

THE PRECISION UNIVERSAL TOOL HEAD

An entirely new tool that bores, faces, trepans, recesses, etc., in Milling Machine, Jig Borer, or Drill Press as easily as in a lathe. Accurately adjustable to a fraction of a thousandth WITHOUT STOPPING EITHER TOOL OR MACHINE. Saves 20% to 50% in actual boring time. One size takes care of every type of internal or external operation on all diameters from 1/16" to 16".

Bulletins and additional information sent on request.

THE PRECISION TOOL COMPANY
Bridgeport, Connecticut

DON'T CALL IN THE CARPENTERS

Till You See What STACKBIN Offers!

Don't build wood stock-bins — expensive to put up — expensive to change! You can build up a stock room quickly with STACKBINS or STACKBIN sections. Move it just as quickly. And the individual strong steel bins or sections can be carried to benches, machines and back.

STACKRACKS
Hold Your Boxes

The STACKRACK, a welded steel rack, holds your boxes or tote pans ready for instant use. Made for boxes of any size. Use the coupon.

In assembling, production, in the stockroom or tool crib or in laying out toolwork, STACKBINS are great time and trouble savers. It costs you nothing to get full details — to see how STACKBIN can cut **your** handling costs.

Send This Coupon For Full Details

STACKBIN CORP.

Patented

PROVIDENCE, RHODE ISLAND

Stackbin Corp.
55 Troy St.,
Providence, R. I.

Without obligation, send literature on ☐ STACKBINS ☐ STACKRACKS for boxes, size ..... (give dimensions).

Name .....

Firm .....

Address .....

REDUCE YOUR FINISHING COSTS

Finishing, polishing, edging and burring of small parts are all speeded up with the new Delta 6" surfacer. Completely flexible in operation, it can be used vertically or horizontally.

Fully enclosed for effective dust collection and complete safety in operation. Rubberless drums mounted on New Departure self-sealed ball bearings, requiring no lubrication.

$28.85

Belt Surfacer only without belt, table, motor or motor pulley.

Welded steel stand available to make machine completely portable. Can be set alongside heavier machines so operator can finish small parts while taking cut on heavier machine, thus combining two operations for the cost of one.

A thoroughly engineered tool at the price of a "cheap" surfacer. ***Write us for complete details and prices.***

DELTA MANUFACTURING CO.

631 E. Vienna Ave., Milwaukee, Wisconsin

ERRINGTON HYSPD

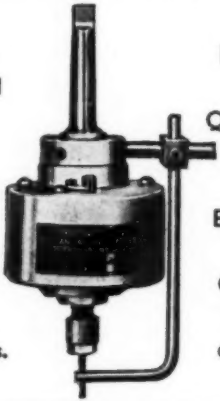
Super-Sensitive Ball Bearing

Cone Drive

2 to 1 Auto-Reverse Tapping Chuck

Combination
Bronze & Ball
Bearings
Thru-Out

Easy and
Economical
Replacement
of
Cone-Clutches.



Depth gauge
facilitates
Quick-Handling
Especially
on
Bottom-Holes

Other Styles
and Sizes
0" to 2" taps

Size	Taps in Steel	Taps in Cast Iron	Price	Code
No. 00	0" to 3/16"	to ¼"	$35.00	Phlam
No. 0	to ⅜"	to ½"	$50.00	Phalanx

The principle on which this Style is designed is especially effective on very small tapping; whereas in the **No. 0** size the Frictional Grip is Greatly **INTENSIFIED**, to cover a wider range, without loss of sensitiveness.

Errington Mechanical Laboratory

Main Office and Works: STATEN ISLAND, New York

Chicago Office: 6047 N. Talman Ave. New York Office: 220 Broadway Boston Office: 930 Old South Bldg.

GRIND DRILLS

Quicker
Truer

Atlas

DRILL GRINDING ATTACHMENT

$21.75

TWO MINUTES—that's all it takes to grind 3/32" to 1/2" drills on this Atlas Drill Grinding Attachment. Grinds both lips the same with proper lip clearance. Easily adaptable to any grinding wheel. Swivel base allows wide range. Send for complete information about this quality attachment. Sold on money back guarantee of satisfaction.

ATLAS PRESS CO.

350 N. Pitcher St., Kalamazoo, Mich.

Factory Displays at:

CHICAGO
35 E. Wacker at Wabash

NEW YORK
130 W. 42nd St.

PHILADELPHIA
113 N. Third St.

FURNISHED COMPLETE WITH

7" Flexible Pad
6 Sanding Discs for Wood
6 Sanding Discs for Metal
Wrenches and Grease

Ask your Stanley distributor for free demonstration or write for details.

With this light, compact electric sander, a man can handle production and maintenance jobs easily and quickly. Scouring and cleaning vats, surfacing wood or metal, removing rust and paint, grinding heavy welds, smoothing castings or sheet metal, rubbing or polishing stainless steels, and removing labels or stencils are some of the many ways in which this inexpensive tool soon pays for itself.

It's light, powerful . . . built for long life and made free-running by ball bearings throughout. Equipped with heavy rubber-covered three-conductor cable.

STANLEY ELECTRIC TOOL DIVISION
The Stanley Works
141 Elm St., New Britain, Conn.

STANLEY STANLEY **ELECTRIC TOOLS**

A Complete Line For Industry *"Cost Less Per Year"*

THE ONLY TAPPER WITH A LEATHER CLUTCH

Ettco - Emrick

TAPPING ATTACHMENTS

ETTCO pioneered sensitive tapping 15 years ago with a leather lined friction driving clutch.

As yet we have found no substitute to equal the smooth, consistent super-sensitive action of leather for the exacting requirements of tapping.

The 1937 clutches have about double the "pull" and wear.—Taking the Tapper apart and changing clutches is now a matter of a few minutes.

The Tappers have ball bearing spindles — needle bearing intermediate gears and all helical gears to insure the greatest possible speed.

The Tap Idles "In"—Not Reverse—This Means Better Holes and Far More Tap Life.

Drop us a line for our catalogue.

These tappers are used with the ETTCO *multiple tapping system* and our No. 71 *gravity foot operated tapping machine.*

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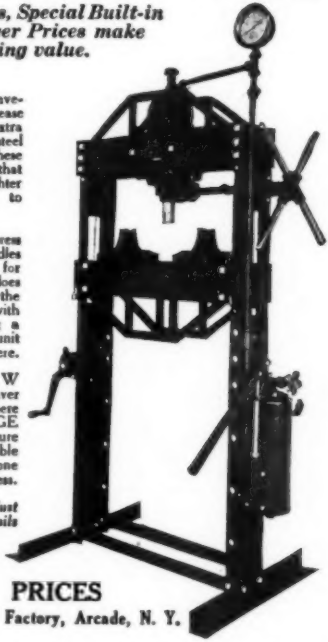
KRW Hydraulic and Sensitive ARBOR PRESSES

New Improvements, Special Built-in Features and Lower Prices make them an outstanding value.



THE last word in convenience, efficiency and ease of operation. Built extra strong and well braced, with steel trusses electrically welded, these presses will withstand strains that would cause presses of lighter and inferior construction to buckle or collapse.

Hand wheel for sensitive press operations has sliding handles which pull out to the ends for increased leverage. Work does not have to be changed from the work table as is the case with other make presses having a separate sensitive press unit mounted on the side or elsewhere.

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Write for special circular, just off the press, giving full details and specifications of all KRW Arbor Presses.

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No. 37—35 ton Hydraulic and Sensitive Arbor Press $150.00
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Gauge and fittings, $15.00 extra on all presses.

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PRODUCTION schedules are being met in plants that gain the savings possible with Contour Sawing.

In a wide variety of machine tool operations 30 to 75% savings are easily made.

The DOALL Contour Sawing and Filing machine, originally developed for die making, is being used more and more for production, and the examples illustrated represent only a few of the many types of work done daily.

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Oliver Farm Equipment Corp., South Bend, Ind.

"We have recommended this machine and will be very glad to continue recommending it."

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1. *Write for representative.*
2. *Arrange for our free demonstration of DOALL in your plant.*
3. *Send for Handbook mailed free when requested on business letterhead.*

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Leakage and Power Losses

Specify "Chicago Rawhide" Packing for accurate size and shape; ***mechanical*** leather ***mechanically*** tanned and treated to give exactly controlled hardness, resilience, heat pressure and friction resistance; for longer packing life and fewer shut downs. ***Write for catalog.***

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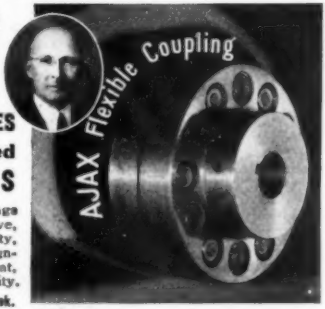

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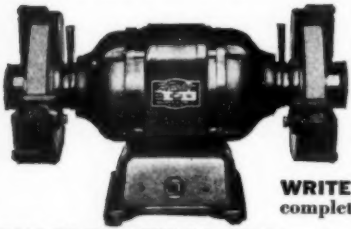
Handy

IT WON'T BURN OUT



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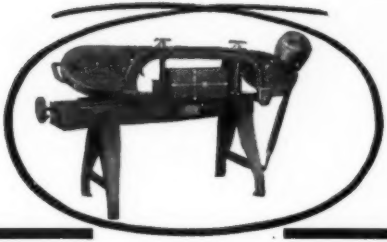

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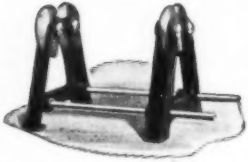
Complete Line of **CAP AND SET SCREWS, BOLTS AND NUTS**

ANDERSON Improved Balancing Ways



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No Leveling Required

A simple and excellent device for balancing straightening and truing.

Swing	Greatest Distance Between Standards	Capacity in lbs.
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40 in.	30 in.	2,000
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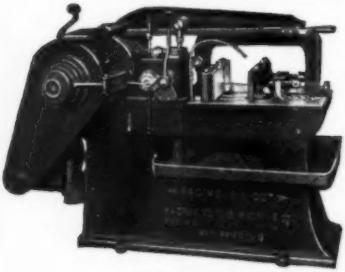

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Graduated dials for feed and pressure.

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A machine for general shop work, for fastest production and for improved accuracy. The last word in simplified modern design.

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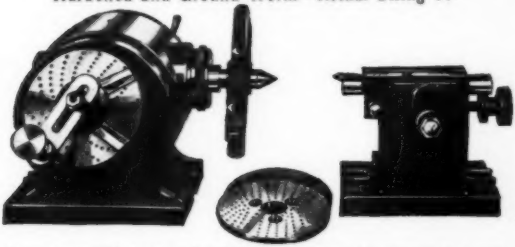

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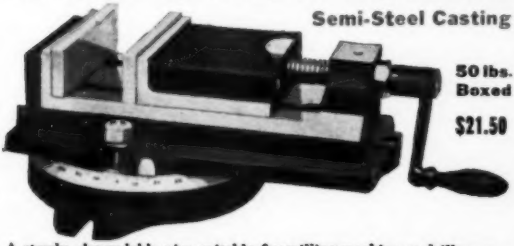
Semi-Steel Casting



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A sturdy, dependable vise suitable for milling machine or drill press—jaws open 3"—depth of jaws 1¾". Hardened and ground jaws. Comparable in every respect to our 6½" vise.

Also Magnetic Chucks, Lathe Chucks, Demagnetizers

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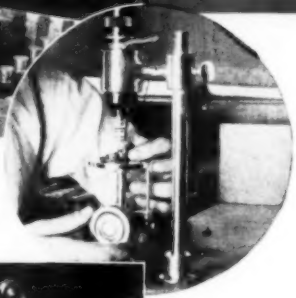
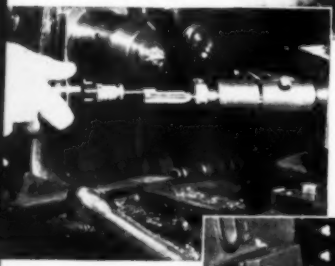
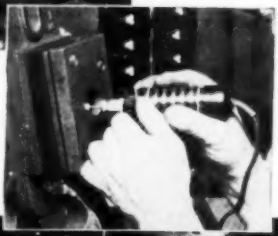
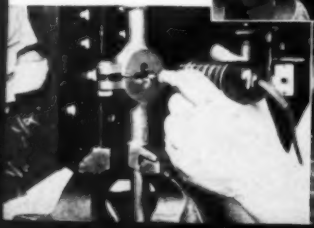




Reaches those hard-to-get-at places. Its light weight and ease of handling in any position save time on a wide range of operations.



Indispensable in die shops and all metal working plants for touching up and polishing every type of die, even when set on presses.



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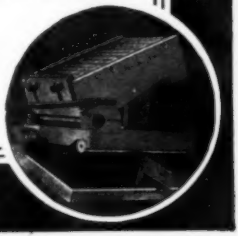

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Try this ON MILD STEEL

● Take a bar of mild steel stock and turn it into a high-speed cutting tool in 15 minutes' time . . . at a cost of 25c. The steps are illustrated above.

Then put this shop-built tool to work. Compare it in cutting and wearing qualities to a high-speed steel tool which costs many times as much. Try Toolweld!

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Let us know the nature of your work — we will gladly recommend and quote prices on the necessary equipment.

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Will forstall these unnecessary losses. Insert its flutes into the broken tap, twist the end—an apprentice can do it in a jiffy—and the tap backs out without injury to the threads.

Made in three and four flute styles.

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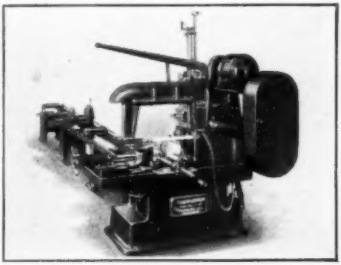

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16 standard types—foot—flange and foot and flange mountings. Worm—Helical—Spur and Planetary gears. 1/50 to 7½ H. P. sizes.

Made by a company which has built geared apparatus since 1909.

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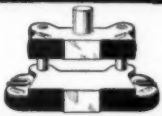

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NEW Combination Etchograph and De-Magnatool

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A Tool Room Necessity for Identifying *and for* Prolonging Life of Cutting Tools

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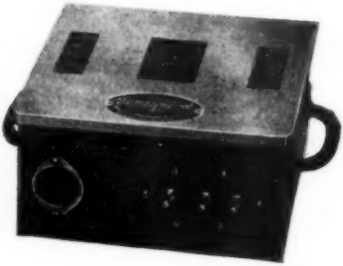

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MANUFACTURERS OF

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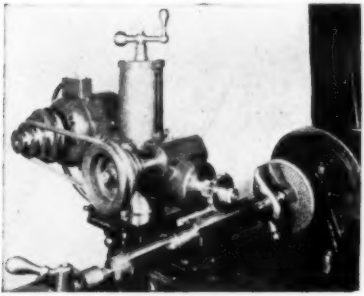
Your lathe becomes a machine of many functions

THE MASTER LATHE CONVERTER



is precision built, mounts easily and quickly upon your lathe. Performs accurately such operations as milling, hobbing, drilling, grinding, broaching. Cuts keyways, spline shafts, gears. Does grinding, internal and external.

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RADIUS DRESSER

A product of long experience and research

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Cardinal Points of Merit

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Dresses a perfect radius from 0 to 1"

Does not become charged with emery

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Easily and accurately set

Price $22.95 F.O.B. Dayton, O.

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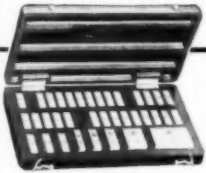
YOU CAN MEASURE IN

FIFTY-MILLIONTHS

OF AN INCH



This set consists of 36 Blocks that will make 80,000 different gage sizes in steps of fifty-millionths (.000050) of an inch, from minimum size of .200 inch to more than 4.250 inches. Complete set, with case, $175. These gage blocks also may be purchased individually in sizes to meet your needs. * Write for new Johansson Gage Catalog — ready soon.

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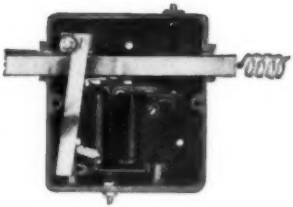
AN IDEAL ELECTRIC TRIP for BELT DRIVEN MACHINES

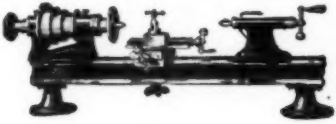


The Simplex Stop Motion is used not only as an electric clutch throw-out, but also as an electric belt knock-off.

THE ATLANTIC CO.

Box 406, Rochester, N. Y.

AMES BENCH LATHES



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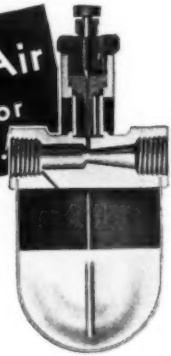

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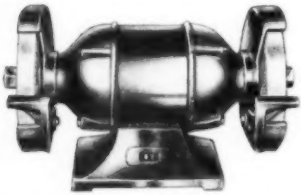

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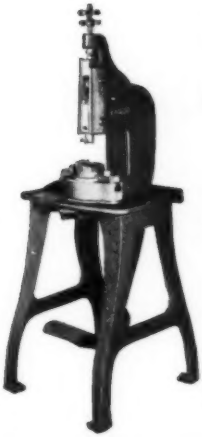
***Mfrs.* of Ball Bearing Motors ¼ to 40 H. P.**



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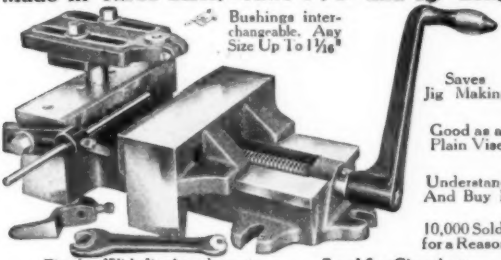

Fig. 1. With Jig Attachments.

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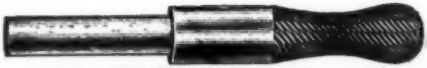

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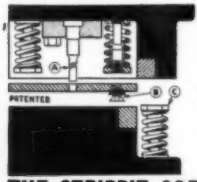

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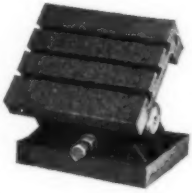

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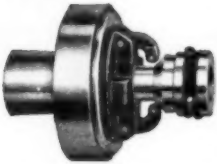

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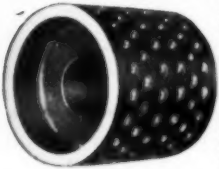

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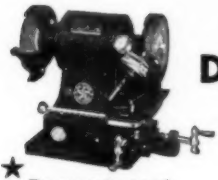

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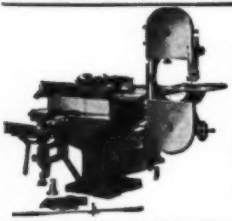

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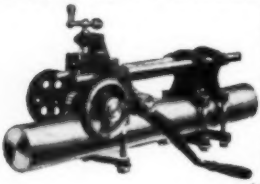

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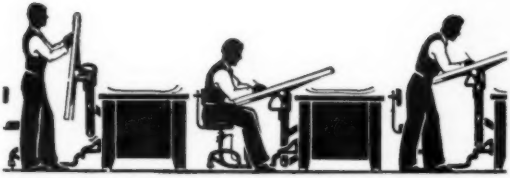

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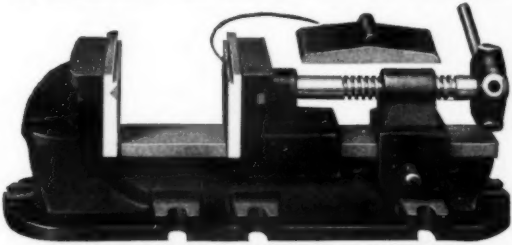

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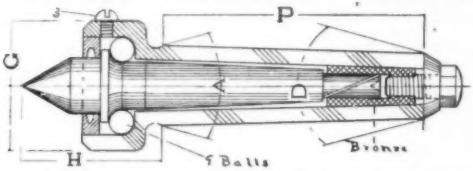

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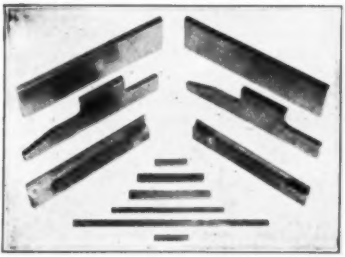

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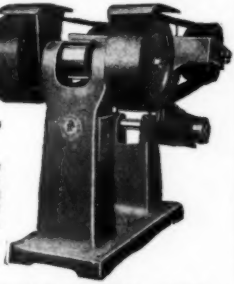

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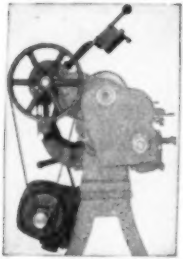

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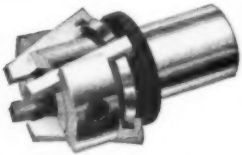

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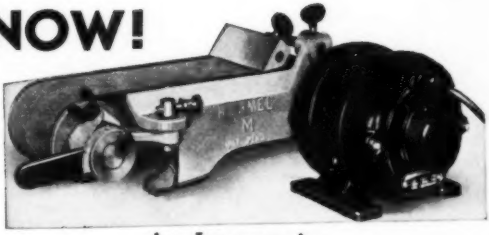

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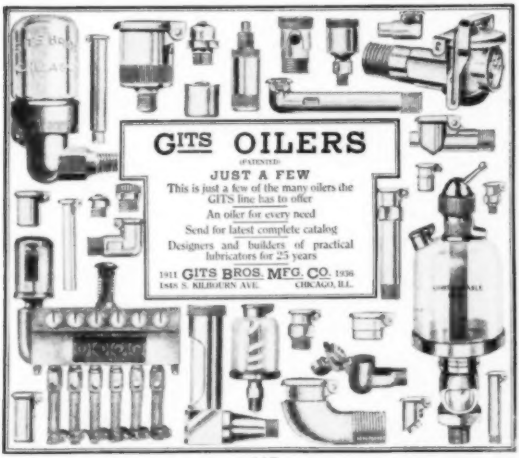

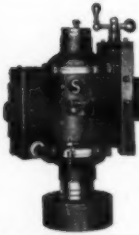

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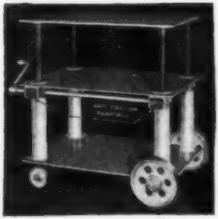

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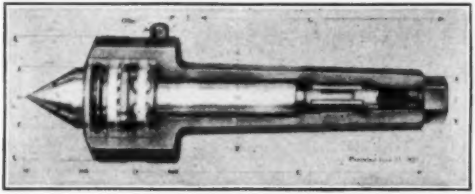

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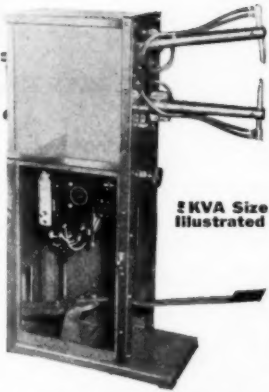

8 KVA Size Illustrated

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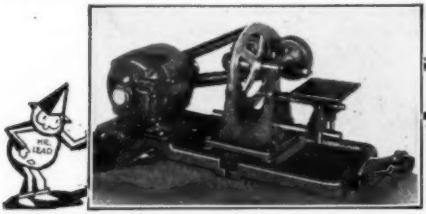

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Timesaver Products Co., 83 So. Desplaines St., Chicago, Ill.

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Hanna Engineering Works, 1763 Elston Av., Chicago, Ill.
Tomkins-Johnson Co., Jackson, Mich.

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Galland-Henning Mfg. Co., Milwaukee, Wis.
Hanna Engineering Works, 1763 Elston Av., Chicago, Ill.
W. H. Nicholson & Co., Wilkes-Barre, Pa.

Air Velocity Meters
Illinois Testing Laboratories, 150 W. Austin Ave., Chicago, Ill.

Angle Dressers
Vince Tool Co., Detroit, Mich.

Angle Plates, Adjustable
McMahon Co., Frank, Dayton, Ohio

Arbor Presses
Atlas Press Co., Kalamazoo, Mich.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
Wilson E. R., Buffalo, N. Y.

Arbor Presses, Air Operated
Hanna Engineering Works, 1763 Elston Av., Chicago, Ill.
Tomkins-Johnson Co., Jackson, Mich.

Balancing Ways
Anderson Bros. Mfg. Co., Rockford, Ill.

Baling Presses
Galland-Henning Mfg. Co., Milwaukee, Wis.

Band Saw Machines, for Metal
Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago
Grob Bros., West Allis, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Tanewitz Works, Grand Rapids, Mich.
Wells Mfg. Co., Three Rivers, Mich.

Band Saws, Open End
Grob Bros., West Allis, Wis.

Bar Cutters
Buffalo Forge Company, Buffalo, N. Y.

Bearings
Chicago Die Casting Mfg. Co., 2602 W. Monroe St., Chicago

Belt Lacing
Armstrong-Bray & Co., 315 N. Sheldon St., Chicago, Ill.

Belt Sanders
Stilsaw, Inc., 2304 Elston Av., Chicago, Ill.

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Delta Mfg. Co. Milwaukee, Wis.

Bench Legs, Steel
Standard Pressed Steel Co., Jenkintown, Pa.

Bench Lathes
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
Hardinge Brothers, Inc., Elmira, N. Y.

Bench Punches
Whitney Mfg. Co., W. A., Rockford, Ill.

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Buffalo Forge Company, Buffalo, N. Y.
Lewthwaite Mchs. Co., T. H., 311E. 47th., N.Y.

Bins
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Breuer Elect. Co., 846 Blackhawk St., Chgo.
Buffalo Forge Co., Buffalo, N. Y.
Clements Mfg. Co., 6650 Narragansett, Chicago
General Blower Co., 401 N. Peoria St., Chicago
Standard Electrical Tool Co., Cincinnati O.

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Buffalo Forge Co., Buffalo, N. Y.
Clements Mfg. Co., 6650 Narragansett, Chicago
Stilsaw, Inc., 2304 Elston Av., Chicago, Ill.

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Triplex Screw Co., Cleveland, Ohio

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Rigid Tool Holder Co., Detroit, Mich.
Russell Boring Bar Co., Middletown, Ohio

Boring Heads
Flynn Manufacturing Co., Detroit Mich.
Rickert-Shafer Co., Erie, Pa.

Boring Machines
Cleveman Mchs. Tool Co., Green Bay, Wis.
R & L Tools, Nicetown, Phila., Pa.
Rickert-Shafer Co., Erie, Pa.

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Taylor Machine Co., Cleveland, Ohio

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Drels & Krump Mfg. Co., 7440 So. Lloyds Blvd., Chicago, Ill.

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Grob Brothers, Grafton, Wis.
Oliver Machinery Co., Grand Rapids, Mich.

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Grob Bros., West Allis, Wis.

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Hisey-Wolf Machine Co., Cincinnati, O.
Rotor Air Tool Co., Cleveland, Ohio
Valley Electric Corp., St. Louis, Mo.
Vonnegut Moulder Corp., Indianapolis, Ind.

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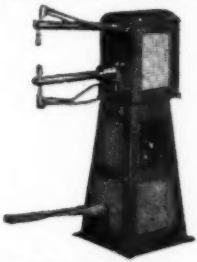

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Cullman Wheel Co., 1359 Altgeld St., Chgo.

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Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Chucks
Ettco Tool Co., 594 Johnson Av., Brooklyn, N. Y.
Hesser Mfg. Co., 1686 No. Paulina St., Chicago, Ill.
Universal Eng. Corp., Frankenmuth, Mich.

Chucks, Air
Tomkins-Johnson Co., Jackson, Mich.

Chucks, Automatic
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago

Chucks, Collet
Apex Machine Co., Dayton, Ohio
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago
Tomkins-Johnson Co., Jackson, Mich.

Chucks, Drill and Tap
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Errington Mech. Labs., Staten Island, N. Y.
Ettco Tool Co., Brooklyn, N. Y.
Hartford Special Mchy. Co., Hartford, Conn.
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago
Scully-Jones & Co., 1901 S. Rockwell St., Chicago, Ill.

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Modern Collet & Mchs. Co., Ecorse, Mich.
Morrison Mach. Products, Inc., Elmira, N. Y.

Chucks, Quick Change
Procunier Safety Chuck Co., 14 So. Clinton St., Chicago

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Chicago Die Casting Mfg. Co., 2502 W. Monroe St., Chicago
Lovejoy Tool Works, 5036 W. Lake St., Chgo.
W. H. Nicholson & Co., Wilkes-Barre, Pa.

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W. H. Nicholson & Co., Wilkes-Barre, Pa.

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Cut-off Saws
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Tannewitz Works, Grand Rapids, Mich.

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Tomkins-Johnson Co., Jackson, Mich.
Waldon Tool Co., Cleveland, Ohio

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Scully-Jones & Co., 1901 S. Rockwell St., Chicago, Ill.

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Universal High Speed Tool Co., 549 Washington Blvd., Chicago, Ill.

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Pratt & Whitney Co., Hartford, Conn.

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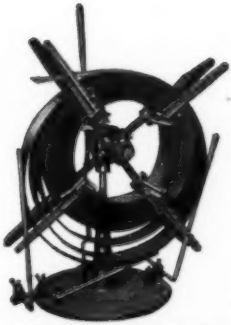
Wm. Carroll & Son, Norwood, Cincinnati, O.

Dowel Pins, Steel
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.
Baumbach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

Draftsmen's Tables
Hamilton Mfg. Co., Two Rivers, Wis.

Dressers, Angle Tangent to Radius
Vinco Tool Co., Detroit Mich.

Drill and Tap
Ettco Tool Co., 594 Johnson Av., Brooklyn, N. Y.



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Chicago Tool & Engr. Co., 3980 So. Chicago Ave., Chicago, Ill.

Drills, Air
Rotor Air Tool Co., Cleveland, Ohio

Drills, Electric
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.
SpeedWay Mfg. Co., 1822 So. 52nd Ave., Cicero, Ill.
Standard Electrical Tool Co., Cincinnati, O.
Wodack Electric Tool Corp., 3629 W. Huron St., Chicago, Ill.

Drill Grinders
Star Mchs. & Eng. Co., Bloomfield, N. J.

Drill Jigs, Special
Houser Mfg., Co., 1626 No. Paulina St., Chicago, Ill.

Drill Jigs, Universal
Houser Mfg. Co., 1626 No. Paulina St., Chicago, Ill.

Drilling Attachments, High Speed
Graham Manufacturing Co., Providence, R. I.
Henry & Wright Mfg. Co., Hartford, Conn.

Drilling Machines, Bench
Atlas Press Co., Kalamazoo, Mich.
Buffalo Forge Company, Buffalo, N. Y.
Cincinnati Mchs. Tool Co., Green Bay, Wis.

Drilling Machines, Multiple Spindle
Buffalo Forge Co., Buffalo, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.

Drilling Machines, Portable Electric
Hisey-Wolf Machine Co., Cincinnati, O.
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.
SpeedWay Mfg. Co., 1822 So. 52nd Ave., Cicero, Ill.
Strand Co., N. A., 5001 N. Lincoln Street, Chicago, Ill.
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Drilling Machines, Post
Buffalo Forge Co., Buffalo, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.

Drilling Machines, Radial
Henry & Wright Mfg. Co., Hartford, Conn.
Western Machine Tool Wks., Holland, Mich.

Drilling Machines, Sensitive
Atlas Press Co., Kalamazoo, Mich.
Buffalo Forge Company, Buffalo, N. Y.
Burke Machine Tool Co., Cornwall, On.
Henry & Wright Mfg. Co., Hartford, Conn.

Drilling Machines, Vertical
Atlas Press Co., Kalamazoo, Mich.
Buffalo Forge Company, Buffalo, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.

Drives, Lathe
Cullman Wheel Co., 1339 Altgeld St., Chgo.
Hardinge Brothers, Inc., Elmira, N. Y.

Electric Blowers
Brauer Elect. Co., 846 Blackhawk St., Chgo.
Buffalo Forge Co., Buffalo, N. Y.
Clements Mfg. Co., 6650 Narragansett, Chicago

Electric Motors with Integral Brakes
Star Mchs. & Eng. Co., Bloomfield, N. J.

Electrical Instruments
Illinois Testing Laboratories, Inc., 156 W. Austin Ave., Chicago

Elevating Tables
Hamilton Tool Company, Hamilton, Ohio
Midwest Too & Engineering Co., Dayton, O.

Emery Stands
Carroll Mfg. Co., L. W., Cincinnati, O.

Emery Wheel Dressers and Cutters
Western Tool & Mfg. Co., Springfield, O.

End Mills
Progressive Tool & Cutter Co., Ferndale, Mich.
Putnam Tool Co., Detroit, Mich.
Weldon Tool Co., Cleveland, Ohio

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Brewster Co. William, 50 Church St., N.Y.C.
Grinding Machinery Co., Detroit, Mich.
Lozna Electric Equipment Co., Toledo, Obl.

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Buffalo Forge Co., Buffalo, N. Y.

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Sutton Tool Co., Detroit, Mich.

Feed Fingers
Morrison Mach. Products, Inc., Elmira, N.Y.

Feed Fingers for Auto. Screw Mchs.
Modern Collet & Machine Co., Ecorse, Mich.
Sutton Tool Co., Detroit, Mich.

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Files, Rotary
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

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Continental Mchs. Specialties, Minneapolis
Grob Bros., West Allis, Wi.
Oliver Instrument Co., Adrian, Mich.
Universal High Speed Tool Co., 649 Washington Blvd., Chicago, Ill.

Filing Room Equipment
Wardwell Manufacturing Co., Cleveland, O.

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Ajax Flexible Coupling Co., Westfield, N.Y.
Lovejoy Tool Wks., 4967 W. Lake St., Chgo.

Flexible Shafts and Accessories
American Rotary Tools Co., 5 State St., New York, N. Y.
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

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Lovejoy Tool Wks., 4967 W. Lake St., Chgo.
W. H. Nicholson & Co., Wilkes-Barre, Pa.

Flexible Shaft Machinery
Haskins Co., N. G., 4654 W. Fulton, Chgo.
Pratt & Whitney Co., Hartford, Conn.
Walker-Turner Co., Inc., Plainfield, N. J.
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Floating Holders
Gairing Tool Co., Detroit, Mich.

Forgings, Hollow Bored
American Hollow Boring Co., Erie, Pa.

Furniture, Machine Shop
Standard Pressed Steel Co., Jenkintown, Penna.
Western Tool & Mfg. Co., Springfield, O.

Gage Blocks, Precision
Ford Motor Co., Johansson Div., Dearborn, Mich.

Gages
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Vinco Tool Co., Detroit, Mich.

Gages, Pin, Plug, Ring and Snap
American Tool Works, Inc., Hartford, Conn.

Gages, Taper
Hartford Special Mchy. Co., Hartford, Conn.
Vinco Tool Co., Detroit, Mich.

Gear Cutters
Brown & Sharpe Mfg. Co., Providence, R. I.

Gears
Abart Gear & Mchs. Co., 4832 W. 16th St., Cicero, Ill.
Chicago Gear Wks., 769 W. Jackson, Chgo.
Massachusetts Gear & Tool Co., Woburn, Mass.
Taylor Machine Co., Cleveland, Ohio

Gears, Master
Vinco Tool Co., Detroit, Mich.

Gear Motors
Star Mchs. & Eng. Co., Bloomfield, N. J.

Generators
Chicago Electric Co., 1338 W. 22nd St., Chicago, Ill.
Janette Mfg. Co., 552 W. Monroe St., Chgo.
Star Mchs. & Eng. Co., Bloomfield, N. J.

Grinders, Air
M-B Products, Detroit, Mich.
Rotor Air Tool Co., Cleveland, Ohio

Grinders, Bench
Baldor Electric Co., St. Louis, Mo.
Carroll Mfg. Co., L. W., Cincinnati, O.
Hammond Machinery Builders, Kalamazoo, Mich.
Hisey-Wolf Machine Co., Cincinnati, O.
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders, Disc
Oliver Machinery Co., Grand Rapids, Mich.
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Grinders, Electric
Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.

Grinders, Electric Bench
Baldor Electric Co., St. Louis, Mo.
Valley Electric Corp., St. Louis, Mo.

Grinder, Flexible Shaft
Haskins Co., R. G., 4654 W. Fulton, Chgo.
Mall Tool Co., 7742 S. Chicago Ave., Chicago
N. A. Strand & Co., 5001 N. Lincoln, Chgo.

Grinding Machines, Floor
Hammond Machinery Builders, Kalamazoo, Mich.

Grinders, Hand
Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.
Dumore Co., Racine, Wis.
M-B Products, Detroit, Mich.
Rotor Air Tool Co., Cleveland, Ohio
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.

Grinders, Heavy Duty
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders, High Speed
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Dumore Co., Racine, Wis.
Mall Tool Co., 7742 S. Chicago Ave., Chicago
M-B Products, Detroit, Mich.
Universal High Speed Tool Co., 549 Washington Blvd., Chicago, Ill.
Walker-Turner Co., Inc., Plainfield, N. J.

Grinders, Pedestal Electric
Baldor Electric Co., St. Louis, Mo.
Valley Electric Corp., St. Louis, Mo.

Grinders, Swing Frame
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders and Polishers, Belt
Oliver Machinery Co., Grand Rapids, Mich.

Grinding Attachments, Drill
Carlson Mfg. Co., C. H., Minneapolis, Minn.
Oliver Instrument Co., Adrian, Mich.

Grinding, Centerless (Contrac.)
Commercial Centerless Grinding Co., 6301 Carnegie Ave., Cleveland, Ohio

Grinding Compound
Timeaver Products Co., 33 So. Desplaines St., Chicago, Ill.

Grinding Machines, Belt
Armgio Co., Milwaukee, Wis.
Production Machine Co., Greenfield, Mass.
Walls Sales Corp., 96 Warren St., New York

Grinding Machines, Cutter, Reamer and Tool
Brown & Sharpe Mfg. Co., Providence, R. I.
National Machine Tool Co., Racine, Wis.
Oliver Instrument Co., Adrian, Mich.

Grinding Machines, External
Chicago Tool & Engr. Co., 8380 So. Chicago Ave., Chicago, Ill.

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Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.
Dumore Co., Racine, Wis.
R. G. Haskins Co., 4654 W. Fulton, Chicago
Hisey-Wolf Machine Co., Cincinnati, O.
Mall Tool Co., 7742 S. Chicago Ave., Chicago
National Machine Tool Co., Racine, Wis.
Pratt & Whitney Co., Hartford, Conn.
Strand Co., N. A., 5001 N. Lincoln St., Chgo
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Grinding Machines, Tool
Hammond Machinery Builders, Kalamazoo, Mich.

Grinding Machines, Universal
Brown & Sharpe Mfg. Co., Providence, R. I.

Grinding Wheels
Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Grinding Wheels, Mounted
Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

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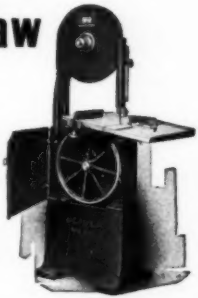
"Oliver" Band Saw



- **Motor-on-Shaft**
- **Precision-built throughout**
- **Operates from light socket**

This "Oliver" 18-inch Band Saw has all the refinements developed for larger "Oliver" Band Saws. It is especially effective in sawing sheet steel. Also sprues of soft metal, ply-metal, hard rubber, compositions, wood, etc.

Rips to 11 inches wide. Cross-cuts and miters up to 8 inches. Table tilts 45° to right. It is a sturdy, precision-built machine in every detail.

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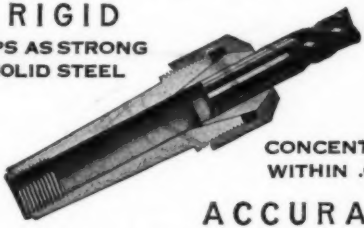

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Hack Saw Machines
Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago

Hammers, Electric
Wedack Electric Tool Corp., 2629 W. Huron St., Chicago, Ill.

Hammers, Tinners
Whitney Mfg. Co., W. A., Rockford, Ill.

Hammers, Mallets and Malls
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Hand Punches
Whitney Mfg. Co., W. A., Rockford, Ill.

Hand Saws, Portable Electric
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.

Hand Screw Machines, Precision Bench Type
Hardinge Brothers, Inc., Elmira, N. Y.

Hangers, Ball, Roller and Babbitt
Chicago Die Casting Mfg. Co., 2502 W. Monroe St., Chicago

Heads, Boring
Flynn Manufacturing Co., Detroit, Mich.

Hole Cutters
W. Seebeck & Staff, Inc., 642 Washington Blvd., Chicago

Hollow Adjustable Mills
Gairing Tool Co., Detroit, Mich.
Reisdorfer Mfg. Co., Rochester, N. Y.

Hydraulic Valves
Galland-Henning Mfg. Co., Milwaukee, Wis.
Hanna Engineering Works, 1763 Elston Av., Chicago, Ill.
W. H. Nicholson & Co., Wilkes-Barre, Pa.

Index Centers
Brown & Sharpe Mfg. Co., Providence, R. I.
Wm. Carroll & Son, Norwood, Cincinnati, O.

Indicating Dials
Federal Products Corp., Providence, R. I.

Indicators, Surface Test
Reich Mfg. Co., J. H., Dayton, Ohio

Jigs and Fixtures
American Tool Works, Inc., Hartford, Conn.
Hamilton Tool Company, Hamilton, Ohio
Hartford Special Mchy. Co., Hartford, Conn

Keyseating Machines
Durr & Son, John T., Brooklyn, N. Y.

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Graham Manufacturing Co., Providence, R.I.

Lapping Compound
Timesaver Products Co., 33 So. Desplaines St., Chicago, Ill.

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Sturdimatic Tool Co., Detroit, Mich.

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Cullman Wheel Co., 1860 Altgeld St., Chgo.
Hardinge Brothers, Inc., Elmira, N. Y.

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Delta Mfg. Co., Milwaukee, Wis.
Hardinge Brothers, Inc., Elmira, N. Y.
Rivett Lathe & Grinder Inc., Brighton, Boston
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
South Bend Lathe Works, South Bend, Ind.

Lathes, Back Geared
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Lathes, Engine
Sebastian Lathe Co., Cincinnati, Ohio
South Bend Lathe Works, South Bend, Ind.

Lathes, Gap Bed
South Bend Lathe Works, South Bend, Ind.

Lathes, Polishing and Buffing
Hammond Machinery Builders, Kalamazoo, Mich.

Lathes, Precision Bench
Hardinge Brothers, Inc., Elmira, N. Y.
South Bend Lathe Works, South Bend, Ind.

Lathes, Precision Bench Screw Cutting
Hardinge Brothers, Inc., Elmira, N. Y.
South Bend Lathe Works, South Bend, Ind.

Lathes, Screw Cutting
South Bend Lathe Works, South Bend, Ind.

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Schauer Machine Co., Cincinnati, Ohio

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Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

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Wm. Carroll & Son, Norwood, Cincinnati, O.
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Burke Machine Tool Co., Conneaut, Ohio

Milling Machines, Plain
Brown & Sharpe Mfg. Co., Providence, R.I.
Burke Machine Tool Co., Conneaut, Ohio

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Janette Mfg. Co., 552 W. Monroe St., Chgo.

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Sebastian Lathe Co., Cincinnati, O.
Steege Machinery Co., 18 S. Clinton St., Chicago, Ill.

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Johnson Tool Co., East Providence, R. I.

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Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo

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National Machine Tool Co., Racine, Wis.

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Oil Gauges
Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

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Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

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Galland-Henning Mfg. Co., Milwaukee, Wis.

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Buffalo Forge Co., Buffalo, N. Y.

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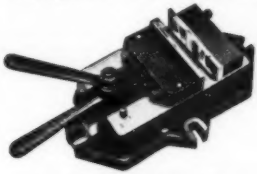

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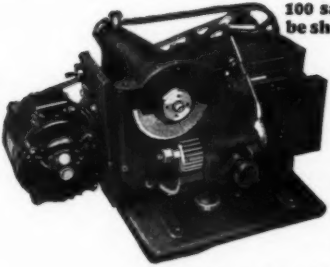

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Greb Brothers, Grafton, Wis.

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Hisey-Wolf Machine Co., Cincinnati, O.

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Brown Machinery Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.
Cleveland Planer Co., Cleveland, Ohio
Clinton Mchr. Co., 32 S. Clinton St., Chgo.
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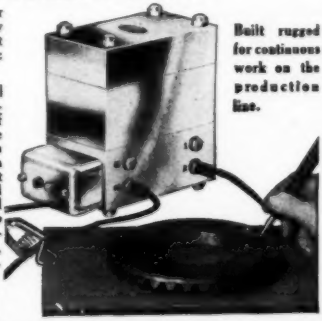

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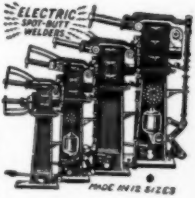

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Lathe, 18"x8' L. & S.
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Lathe, turret No. 6 Woods, tilted.
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Miller, No. 4 Brown & S., plain.
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Drill, 24" Mechanics, sliding head, back geared, power feed	250.
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3— 80	Diehl	550/1100
1— 75	G. E.	575/ 870
1— 60	West.	107/ 160
2— 60	El. Dy.	450/1200
5— 60	El. Dy.	525/1050
2— 50	West	225/ 600
1— 50	West.	600/1200
12— 40/50	Cr. Wh.	175/ 700
2— 40	West	120/ 240
1— 40	West.	300/ 900
2— 35	West.	500/1500
1— 30	El. Dy.	800/1600
12— 20	G. E.	650/1950
1— 20	G. E.	500 1500
1— 18/22	West.	133/ 266
1— 15	El. Dy.	450/1350
1— 15	Reliance	400/1600
1— 15	El. Dy.	450/1350
1— 15	West.	600/1200
1— 12½	West.	177/ 350
10— 10	West	500/1500

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1—1000 k. w., G. E. type M. P. C.,

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A. C. MOTORS
Synch. Type

H.P.	TYPE	VOLTS	SPEED
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1—1500	G. E.	440/ 220	180
1— 850	G. E.	2300	720
1— 500	G. E.	440	1200
1— 450	West.	440/220	257
1— 225	El. Mchy.	2300/4150	450
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1— 250	F. Morse	2200	1200
1— 250	West.	440/220	585
1— 225	G. E.	440/220	1800
1— 200	West.	440/220	575
1—200	West.	2200/550	870

SQUIRREL CAGE TYPE

1— 250	West.	2300/440	580
1— 200	G. E.	550	600
1— 200	West.	220/440	1160
1— 100	G. E.	440/220	720
1— 100	West.	440/220	1200

Above is Only Partial Listing. We Specialize in All Electrical Equipment, Motors, Pumps, Generators.

FOR SALE BY

Marr-Galbreath Machinery Co., 55 Water St., Pittsburgh, Pa.

Air comp., 8x8" Chicago, NSB.
Air comp., 10x8" Ing-Rand, ER-1.
Air compressor outfits for garages, ¼, 1 & 1½ h. p. 1/60/110-220.
Air compr., 4"x4" Union air cooled.
Bolt threader, 2½" Landis dbl., m. d.
Boring mill, 30" Colburn, turret hd.
Boring mill, 30" Bullard VTL, threading attachment.
Boring mill, floor, 6" bar N. B. P., 230 v. d. c., 2 column.
Brake hand, 60"x12ga., Chicago.
Brakes, hand, 4'xl ga. Robinson
Brake lining, punch and riveting machine, m. d.
Chain hoists, 3 and 4-ton.
Crusher, No. 1 Williams Little G., b.d.
Die sinker, No. 3 P. & W., r. t.
Drill, 16" Avey b. b., m. d.
Drill, 28" Superior, b. g., power fd.
Drill, No. 11-B, Natco, 16-sp., m. d.
Drill, rad., 2½' Fosdick & Holloway.
Drill, radial, 3' Dreses, tapping att.
Drill, radial, 3½' Canedy-Otto.
Grinder, sur., No. 1 W. & M. mag. ck.
Grinder, Nos. 1, 1½ & 2, tool & cut.
Grinder, 7½ h. p., U.S. dbl. end, 3/60.
Grinder, pl. 11 B. & S. 4x30" (cheap).
Hammer, 40 lb. Bradley horiz. helve, m. d.
Hammer, power, 50 lb. Boss, b. d.
Hammer, 1000 lb. Chamber'g st. drop.
Hammer, power, 50 lb. Little Giant, belt drive.
Hammer, 100 lb. Mayer, power.
Hammer, 200 lb. Beaudry, power.
Hammer, 400 lb. Bliss board drop, b. d.
Hammer, 800 lb. Erie SF steam or air.
Hammer, stm. drop, 1500 lb. (nr. new).
Hammer, Syntron Elec., 1/60/110/.
Header, cold, ⅜" W.-F. D. S.-OD.
Hoist, chain, 4-ton triplex, Y. & T.
Jointer, bench, 4" Wallace.
Keyseater, No. 2 Catlin, cap. 2"x15".
Keyseater, No. 3 Mitts & M., belt.
Lathe, 11"x5' So. Bend q. c. g., 2 cks.
Lathe, 11" Sundstrand, g. h., s. p. d.
Lathe, 14"x19" Fay automatic.
Lathe, 16"x6' Hendey, q. c. g., TA.
Lathe, 16"x6' L. & S., q. c. g.
Lathe, 16"x6' Amer., q. c. g., 5-step cone.
Lathes, 16"x7' National, q. c. g., (3).
Lathe, 17"x8' Sidney qcg. 3-step cone.
Lathe, 19"x8' Sidney qcg. 3-step cone.
Lathe, 20"x8' Hendey q. c. g., tie-bar hd
Lathe, 22"x12' Rahn-Larmon, q. c. g.
Lathe, turret, No. 4 W. & S., bar feed, m. d. (2).
Miller, No. 3 Cincinnati, pl. cone.
Miller, No. 2 Brown & S. pl. cone.
Miller, No. 1½ American, pl. cone (2).
Miller, pl., No. 15 Garvin, 42x10½x21".
Miller, No. 4 Ohio, table 101".

Pipe machine, 4" Williams, gear box, motor drive.
Pipe machine, 12" Cox., b. d.
Pipe machine, 12" E. C. & B., s. p. d.
Pipe machine, 18" Wieland, m. d.
Planer, Gray, 56x48x10', 4 heads.
Polishing stand, 3 H P. US., 3/60/220.
Press, No. 18-C. Bliss OBI., plain.
Press, horn., No. 2 Swaine, 2" str.
Press, 30-ton Lourie hydraulic.
Press, trimming 58½ Toledo d. b. g., 10" stroke, friction clutch, m. d.
Press, hydraulic 200 ton oil gear pump m. d., rapid ac., 10" st., bed 24x16".
Pump, tripl., 1½"x4" Worthington, b.d.
Punch & cop., No. 12 W-W, 200-t., m. d.
Punch & shear, 25x24 U. Buffalo,
Punch shear, S. E., ⅜"x⅜", L. & A. universal, motor drive.
Punch, s. e. rapid, No. 000 H. & J., 16" throat.
Riveters, Shuster, ⅜" & 3/16", belted
Riveter, No. 120 Grant, cap. ⅜", m. d.
Rolls, 7"x5/16" pyramid, d. e., belt.
Rolls, 42"x3" Pexto, latch hsgs., hand.
Rolls, 48"x3" Niagara, Initial, power.
Sandblasts, Pangborn AU-3 & AA-1.
Sandblast, Leiman, size A-1.
Saw, cold, No. 7 Espen-L., 15" belt.
Saw, cold, No. 1 Newton, 4½" belt.
Saw, hack, No. 4 Marvel, m. d.
Saw, hack, 6x6" Peerless, for m. d.
Saw, No. 1 Marvel hack, 4"x4", b. d.
Saw, 6"x6" Racine hack, gear box, belt drive.
Shaper, 15" Blount, friction type.
Shaper, 20" G. & E. b. g., m. d.
Shaper, 21" Smith & Mills.
Shaper, 24" Barker b. g. V-ram, b. d.
Shaper, 24" Gould & Eberhardt, b. g., high duty, b. d.
Shaper, 28" Hendey friction vise.
Shear, No. 16-A Niagara ring and circle, 14 ga.
Shear, throatless 18-M Marshalltown, motor drive.
Shear, bar 3" United, 24" blade, m. d.
Shear, bar & splitting, cap. ½" plate.
Shear, slit'g, Buffalo 24-S (Armor pl.)
Shear, plate, 16'x½" L. & A. 20" gap.
Shear, squar., pwr., 30"x18 ga., belt.
Steam turbines, 100 h. p. 900 rev (2).
Turret lathe, Garvin, 1-½" HS; W. F.
Turret lathe, 18"x3½" Libby, m. d.
Turret lathe, 24"x6½" Steinle, m. d.
Turret lathe, 26"x4½" Libby, m. d.
Valve refacer, Kwik-Way, cabinet base, m. d.
Welder, Arc 300 amp. 3/60/220.
Welders, arc, 35 amp., transformer.
Welding & cutting generator, Carbic
Wire str. & C-O—⅜"x4' Shuster (2).
Wheel press, 60 ton 34"x8½", b. d.

Partial List. Get Our New Complete Stock List.

USED AND REBUILT MACHINERY

FOR SALE BY

Joseph Hyman & Sons, - Tioga & Almond Sts., Philadelphia, Pa.

POWER PRESS SPECIALISTS

600 ton American cam embossing.
150 ton E52 Ferracute embossing.
No. 4-B Bliss, double crank, 42".
No. 205E Toledo, dble. crank, gap.
No. 79½ Bliss, 16" stroke.
No. D201 Ferracute.
No. 201 & 201½ V. & O. threaders.
Hundreds of presses of various types.

FOR SALE BY

M. A. Wertman Machinery Co., 623 Penton Bldg., Cleveland, Ohio

Automatic, ¾" cone, m. d., rebuilt.
Automatic, ⅜" model B Cleveland.
Broach, No. 3 LaPointe, Hudson dbl.
Drill, 2-spind Sipp m d. like new.
Drill, Natco B14 22-spindles.
Lathe, Monarch, 14"x6' qcg. &dbg.
Lathe, Gisholt 21" turret.
Lathe, Boye & Emmes 20"x10' perfect.
Grinder, No. 70 Heald.
Grinder, No. 13 B.&S. motor drive.
Grinder, No. 3 Wilmarth & M. surface.
Planer, 24"x6' Gray, Al cond.
Thread miller, Taft Pierce.
Saw, Racine No. 10, 8"x8".

FOR SALE BY

E. L. Klauber Machinery Co., 320-322 South Third St., St. Louis

Bolt cutter, 1" Landis S. H.
Drills, 1, 4 & 6 spindle H. S.
Lathe, 12"x5' Seneca Falls.
Lathe, 15"x8' Sebastian 22" gap.
Lathe, 19"x8' Draper, q. c. g.
Miller, Newton horizontal 16"x55".
Press, No. 6 Niagara o. b. i.
Turret lathe, No. 2 W.&S., long bed
Welders, spot, 12 and 25 k. w.
Welder, butt 15 k. w. Toledo.

FOR SALE BY

General Blower Co., - - - 401 N. Peoria St., Chicago, Ill.

BLOWERS—FANS—EXHAUSTERS.

For Dust Collecting — Ventilating.
Oil and gas burners, cupolas, furnaces, etc.
Roots—Connersville and centrifugal blowers.

What are your blower requirements?

FOR SALE BY

McDonald Machinery Co., 1535 N. Broadway, St. Louis, Mo.

Air comp., Ingersoll-Rand 7x6.
Boring mill, Lucas No. 21 horizontal.
Boring mills, Barrett 5" bar horiz.
Boring mill, Niles 36" vert., 2 hds.
Boring mills, Baush 44" vert., m. d.
Brake, Ohl 10' No. 10 ga. m.d. press.
Drills, Barnes 20"&24" Camel back.
Drills, radial, Fosdick 3', Prentice 3'; Mueller 2½' all s. p. d.
Gear cutter, G. & E. 36" s. p. d.
Gear cutter, G. & E. 60" m. d.
Gear hobber, G. & E. 24" & 48".
Grinder, B. & S. Nos. 10 & 16 plain.
Grinder, P. & W. 12" vertical surf.
Lathes, Reed-Prentice 16"x8', q. c. g., grd. hd.; Hendey 18"x8', q. c. g.; 50 others in stock.
Milling machines, B. & S. No. 3 univ.
Milling mchs., Rock, No. 2-B s.p.d.
Hendey No. 1-B, Kemp. No. 3; Ohio No. 29; vertical slott, attch., all universal; Cincinnati No. 3 pl. LeBlond No. 3-H.; Brown & S. No. 3-B, s. p. d., Brown & Sharpe No. 3, all plain, Cincinnati 12" Mfg.; Kempsmith, No. 33 Prod.
Planer, 60"x48"x16' Gray 2 heads.
Punch press, Fer. No. S9-52 d. c. Cons. Nos. 1 & 2 o. b. i. Niagara No. 66-D d.c. Ohl d. c. grd. No. 50 O. B. I. geared.
Shapers, G. & E. S. & M., Cin., Ohio American, Steptoe, Queen City, 12", 16", 18", 20", 24" and 26"; Cinti. 24" m. d. g. b. Rhodes vert.
Screw machine, Brown & Sharpe. No. 2 auto.; B. & S. No. 00 Auto.
Turret lathes, W. & S. No. 2 Auniv.

USED AND REBUILT MACHINERY

FOR SALE BY

West Penn Machinery Company

1210 House Building, • • • Pittsburgh, Pa.

Air compressors, 30 to 2500 cu. ft.
Baler, 12-P Logeman hdy.
Beader, Yoder, 12 ga. m. d.
Bender, pipe, 24" Wallace, m. d.
Blower, No. 4 Roots, cap. 2110 c.f.m.
Bolt cutter, Acme 2", motor drive.
Bolt cutters, Landis, 1½" b.d., 2½" m.d.
Bor. mills, 24" Bullard New Era.
Boring mill, 42", 2 heads, Bullard.
Boring mill, 62" Betts, 2 heads, b. d.
Bor. mill, hor. 5" bar Barrett, m. d.
Brakes, 3' x 3/16" Chicago, m. d.
Bulldozers, Nos. 2, 4, 6, 9, 28, & 30.
Cranes, Electric Traveling.
Crane, crawler, gas., No. 2 No'wes.
Draw bench 20000 lb. W-F.
Drill, radial, 4' Prentice, t. a., b. d.
Drill, rad. 5' Cincinnati-Bick., m. d.
Drills, radial, 6' Fosdick.
Drill, rad. 6' Reed-Prentice, s. p. d.
Drill, mult. 24 sp. No. 30 Natco.
Drills, upright 10" to 36".
Engine, gas, 20 h. p. Bessemer.
Flanger, McCabe, ½" capacity, dies.
Gear cutters, 11", 18" & 24" Gleason.
Gear cutter, 60" Eberhardt.
Grinder, roll, Farrel 28" x 64".
Grinder, d. e. 2 h. p. 220/440/3/60.
Grinder, disc, No. 8—20" Besly, b. d.
Grinder, plain, 10x24 Landis.
Grinder, sheet, Mattison.
Grinder, roll, Farrel 28x72.
Grinder, surface 8" Heald.
Grinder, sur. 14" Pratt & W., m. d.
Grinder, surf. Diamond, table 48x16".
Grinder, universal 12x42 Landis.
Hammer, 100 lb. Little Giant.
Hammer, Blacker, power, 35-lbs.
Hammer, Brad. 500 lb. upright.
Hammer, power, 90-lb. Justice, b. d.
Hammer, pwr., 100 lb. Brad. cush.
Hammers, Nos. 2-B, 3-B, 4B, Nazel.
Hammers, steam, 600 lb. to 6000 lbs.
Hammer, stm. dr., 1500 to 10000 lb.
Hogging machine No. 3 C, M&M.
Keyseater, No. 2 Baker, b. d.
Lathe, 11" x5' Meyers, p. c. g., b. d.
Lathe, 20" x 10' Southbend, q.c.g., b.d.
Lathe, 18" x8', L. & S., b. d.
Lathe, 26" x18' Wickes g. h. q. c. g.
Lathe, 36" x44' American, g.h.d., m.d
Lathe, 48" x30' Pits'h., p. c. g., b. d.
Lathe, 60" x16' Putnam, b. d.
Lathe, spinning 32" b. d.
Lathe, turret, 18" Libby, m. d.
Lathe, turret, 24" Steinle, 6¾" hole.
Lathe, turret, 34" Gisholt, b. d.
Miller, cont. rot. Ingersoll 72".
Miller, vert. No. 6 Becker, m. d.
Miller, B.&S. Universal No. 4, b. d.
Miller, pl. No. 2 Kempsmith, b. d.
Motors, a. c. & d. c.
Nibbler, Gray 3/16"-34" throat.
Nibbler, No. 2 Campbell, ⅜", m. d.
Nut tapper 8 sp. 1" National.
Pickler, 4 arm Mesta, 16' radius.
Pipe machine 2" Landis b. d.
Pipe meches, 6" Williams.
Pipe machine, 6" Landis b. d.
Planer, 42x42"x12' Cinc., 3 hds., b.d.
Press brake, Cincinnati 10' x⅜", m.d.
Press, No. 3 Bliss, Stiles type.
Press, cam, No. 69 N Bliss, dbl act. inc.
Press, hor., No. 43 Toledo 1½" stroke.
Press, No. 93 Toledo, b. d.
Press, hyd. 100-ton South.
Press, No. 55 Toledo, bed 20x19.
Press, No. 57 Toledo, 32" x32", str. 6".
Presses, hyd. 200-ton Oilgear.
Press, dbl. crank No. 5 Bliss, 2" str.
Press, o. b. i., Nos. 18, 19, 20 Bliss.
Press, screw, No. 87 Niagara.
Press, 6 spindle, W-F.
Punch, beam, No. 5, H. & J.
Punch, Rock River, ½"-¾".
Punch, EF Cleveland, 36" thrt., 1½"-1"
Punch, L. & A. ¾"-¼", 6" thrt., m. d.
Pumps, Cent. 6", 4", 1", m. d.
Riveters, air, hammer, spinning.
Roller, thread, No. 40 W.-F., b. d.
Rolling mill, cold 9" x18".
Saw, band, metal, 10x10 Napier.
Saw, 13x13 Peerless, shaping, m. d.
Saws, friction, Nos. 2, 3 & 4 Ryerson.
Scale, sheet bundling, 2500 lbs.
Saw, cold, 48" Newton.
Saw, hack, Racine, 12x12.
Shaper, 32" Cincinnati, b. d.
Shapers, 16", 20", 24" & 36 G. & E.
Shear, circle No. 3 Bliss, 40" x20 ga.
Shear, circle No. 15A Nia., 48" x16 ga.
Shears, alligator, 1½", 2", 3", 4" & 6".
Shear, angle 6x6x¾", Cleveland.
Shear, bar 1½", New Doty.
Shear, bar No. 2 H. & J. 2".
Shear, bevel, Lennox ⅜", b. d.
Shear, cir. & flan. No. 208 Niagara.
Shear, comb. 24-U-Buffalo.
Shear, sq. 11' x10 ga. Niagara, m. d.
Shear, sq. 16" x¼" L. & A, m. d.
Shear, plate, 80" x¼" Pels.
Shear, plate 66" x1" H. & J.
Shear, plate, 12' x½" United m. d.
Shear, rotary 24" thrt. cap. ⅜", m.d.
Shear, Streine 10'-16 ga.
Shear, Buffalo all steel 3" sq., m. d.
Slitter, gang 36" b. d.
Slotters, 6" Newton, 8" & 21" Betts.
Slotter, 24" Newton, motor drive.
Straightener, shape, Sutton No. 2.
Straightener, beam, 24" United m.d.
Straitener, 54" United 17-rolls 3½" dia.
Straightener, 14", 4" rd. Abramson.
Upsetters, 1" to 6".
Welder, 40 kw. Thom. 2 pcs. ½".
Welder, butt 1½" Winfield.

FOR SALE BY

Aaron Machinery Co., 176 Lafayette Street, New York, N. Y.

Drill, radial, 2', 3', Mueller gr. box.
Engraving machine Gorton.
Forming rolls, makes channels, etc.
Grinder, Landis plain, 20"x72".
Lathe, 16x6 Amer., q.c., tap., pan $275.
Lathe, 24"x14' L& S, taper, ... $575.
Lathe, 20"x10' H., rais. blocks $575.
Lathe, turret, 1½" Milholland.
Lathe, precision screw cutting, ¾" cap.
Press, No. 20-B Bliss, geared.

FOR SALE BY

Brownell Machinery Co., 150 Pine Street, Providence, R. I.

Gear cutter, No. 14 Brown&Sharpe, spur and bevel 24"x6".
Gear cutter, No. 13 B. & S.
Grinder, No. 1 Norton tool.
Grinder, No. 55 Heald cylinder.
Lathe, 60"x30' Pond.
Lathe, 32"x28' New Haven.
Miller, No. 3 Hendey universal.
Miller, No. 2-M P. & J. turntable.
Shaper, 20" G. & E.

FOR SALE BY

Indianapolis Screw Products Corporation

621 North Noble St., - - - - - Indianapolis, Indiana

Screw machine, Gridley automatic, model G, ¾" rd., extra box mill, six sets collets and pushers, threading spindle, stock reel and stands. Can be seen running.

FOR SALE BY

Davis Machinery Co., St. Clair & Washington Sts., Toledo, Ohio

Bolt cutter, 1" Landis dbl. hd. lead screws.
Drill, No. 2 Colburn, mfg. type.
Gear hobbers, No. 12 B.-C. double overarm, m. d.
Grinder, No. 3 Wilmarth & M. surf.
Grinder, Capitol internal.
Keyseater, No. 2 Mitts & Merrill.
Lathe, 3"x36" Jones& L. flat turret.
Lathe, 28"x18' Pittsburgh, q. c. g.
Lathe, 16"x8' Walcott, q. c. g.
Mill, No. 2 Cleveland univ. compl.
Mill, No. 4 Cin. H.P. plain, c. p.
Mill, model C Becker vertical.
Mill, No. 5B Brown & S. pl., s. p. d.
Nibbler, 6" Campbell metal.
Press, No. 53 Toledo, s. s.
Planer, 36"x36"x8' American, 2 hds.
Radial drill, 3' Bickford, motor dr.
Radial drill, 4' Hammond hinged arm
Screw machine, ¾" Cleve. model B aut.
Screw machine, No. 6 Warner & S.
Screw machine, No. 3 Foster hand.
Threaders, ¾" Geometric.
Shaper, 20" & 24" Ohio crank, b. g.
Shear, 205 P.S. & W. circle&flanging.

FOR SALE BY

Reliance Machinery Sales Company

1405 Brighton Place, N. S. - - - - Pittsburgh, Pa.

Air compressor, 8"x8" Bury, 129'.
Brake, press, 72" Rob. toggle m. d.
Brake and folder, 72" Niagara, 22 gauge, motor 3-60-220.
Bulldozer, No. 9 W.-W., 70,000 lbs.
Drill, 4 spindle Colburn, Mfg. type, cap. 2", like new.
Lathe, 27"x18' Pittsburgh, taper.
Lathes, spinning, 30" Bliss & Tol., roller bearing.
Lathe, 18"x12' L. & S., q.c.g., cone.
Miller, No. 5C Becker vertical.
Nibbler, No. 1 Gray 34" tht., 3/16" capacity, m. d.
Press, CG-6 Ferracute OBI, geared, 12,000 lbs., 3" stroke.
Press, No. 21 Bliss, 3" stroke., late.
Press, No. 3½B Bliss toggle.
Press, No. 92-C Toledo, dbl. crank, geared, 4" shaft 2" str.
Press, Robinson dbl. cr., 80" wide, 4" shaft, grd. 3" stroke.
Press, dbl. crank, 124" wide, 7" shaft, 6" stroke.
Shapers, 16", 20", 24", 25", 32" crk.
Shear, 10"x18 gauge Pexto.
Welders, 300 and 400 amp. Lincoln. motor end 3-60-220-v.

FOR SALE BY

Hasco, Inc., - - - 40 Clinton St., Newark, N. J.

Automatics, Gridley model G, all sizes.
Automatic, National Acme 2¾", model B, 4 spindle.
Gear burnisher, Cin., used 30 days.
Lathe, turret, Bullard New Era 36".
Lathe, turret, Bullard New Era 42".

FOR SALE BY

The O'Brien Machinery Co., 113 N. Third St., Philadelphia, Pa.

Band saw, 42" American, V belt, m.d.
Bolt cutter, 1½" cap. Landis.
Boring mill. 24" Bullard, rap. prod., threading attachment.
Boring mill, 36" Bridgeport.
Crane, 36' Gantry, 20 ton, hand oper.
Drill, 3' American radial, s. p. drive.
Drill, 6' Mueller radial, mtr. dr.
Drill, 32" Cin. Bick. upright, s.p. drive.
Grinder, No. 55 Heald.
Hammer, 100 lb. Bradley, helve.
Hammer, 800 lb. Erie, steam forging.
Hammer, 1100 lb. NBP. steam forg.
Hammer, 2000 lb. Chambersburg double frame steam.
Lathe, 30x24 New Haven, belt.
Lathe, 24"x12' N. B. P. motorized, O. C.
Miller, 2A B. & S. universal table 42"x11", single pulley drive.
Miller, No. 2 Cincinnati univ., table 36"x10", cone drive.
Miller, No. 4B Becker vertical, table 10"x26".
Miller, No. 5 Cincinnati plain, table 76"x19", s. p. drive.
Pipe machines, 2, 4, 6, 8 and 12" belt and motor drive.
Punch, No. 3 Royersford, double end, 12" throat, cap. 1½"x1½".
Shapers, 14, 16, 20 & 24" various makes
Shear, 8' Niagara, 15" gap, 3-16" cap.

FOR SALE BY

Lang Machinery Company, 28th St. & A. V. R. R. Pittsburgh, Pa.

Air compr., 12"x10" Chgo. "nsb" m.d.
Blower, No. 5 Sturtevant, 8½" dis. b.d.
Bor. Mill, 42" Gisholt, r.p.t., s.p.d.
Bor. Mill, 10' N. B. P. 2 hds. m. d.
Bor. mill, 54" Colburn, 2 hds. r. p. t.
Bor. mill, 54" Bullard, 2 hds. r. p. t.
Bor. mill, 72" Colburn, 2 hds. r. p. t.
Bor. Mill, 76" Bullard, 2 Hds. m.d.
Bor. mill, 84" Sellers, 2 hds. b. d.
Bor. mill, 10'-16' Betts, 2 hds. b. d.
Boring mill, hor. 3" Rockford. tbl.
Boring mill, hor., 7" bar N B P., m.d.
Bor. mill, 6" bar Barrett, m. d.
Bolt cutter, 1" Landis, sgl. hd., b.d.
Bolt cutter, 2" Acme, sgl. hd., b. d.
Bolt cutter, 2½" Acme, sgl. hd., b.d.
Drill, rad. 2' Fosdick, t.a., b. d.
Drill, rad. 3' Bickford, t. a., b. d.
Drills, upright, 14" to 32".
Drill, 4 sp. No. 2 Foote-Burt, m. d.
Grinders, single and double end.
Grinder, disc, dbl., 18" Diamond, b.d.
Grinder, plain, cyl. 10"x50" Norton.
Grinder, surface, No. 2 Brown & S.
Hammer, 1001b. Bradley, cush. hel.
Hammer, 5000 lb. Chamb., dbl. leg.
Keyseater, No. 3 Mitts & M. b. d.
Keyseater, No. 3½ Baker, b. d.
Lathe, Tur. No. 3 Foster, m. d.
Lathe, Tur. (5) 24" W & S. univ., b.d.
Lathe, 13"x6' South Bend, p.c.g., b.d.
Lathe, 14"x6' Carroll, q. c. g., b. d.
Lathe, 18"x8' Lodge & S. q.c.g., b.d.
Lathe, 24"x10' Bradford, p.c. g., b.d.
Lathe, 26"x11' Wickes, s.-q.c.g., b.d.
Lathe, 26"x12' Bridgeford, q.c.g., b.d.
Lathe, 28"x10' Sch. & B., q.c.g., bd.
Lathe, 30"x14' L. & S. q. c. g., m.d.
Lathe, 36"x10' Wickes, s.-q.c.g. b.d.
Lathe, 36"x12' Bridg. grd. hd., q.c.g.
Lathe, 36"x16' Sch. & B. l.c.g., b.d.
Lathe, 38"x14' Boye & E. q.c.g., b.d.
Lathe, 39"x26'6" New H., p.c.g., b.d.
Lathe, 40"x40' H. S. & G., grd. hd.
Miller, Univ. No. 3 Le Blond, h.d., b.d.
Miller, Vert. No. 5-C Becker, m. d.
Miller, plain, No. 3 Brainerd, b. d.
Miller, univ. No. 1½ B & S., b. d.
Miller, thread, 6"x48" Pratt & W.
Miller. vert. No. 4-B Becker, m. d.
Planer, 42"x56"x10' Cin., 4 hds., m.d.
Planer, 60"x48"x14' N.-B.-P. 3hds. b.d
Press, O.B.I., No. 21 Bliss, 3" str.
Press, No. 84 Toledo, s. s., str. 2"
Punch, No. 5 H. & H. 62" th. 1½"-1½".
Roll, bending, 10'x¾" H. & J.
Roll, bending, 30'x1" Southwark.
Shaper, 20" American, b. g., b. d.
Shaper, 28" Queen City, b. g., b. d.
Shaper, 24" Cincinnati, b. g., b. d.
Shear, Power, 36"x¾" United, b. d.
Shear, Alligator, Lewis, cap. ½".
Shear, plate, 8'x1½" Morgan, m. d.
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Welders, arc, 200-300-400 amp. Linc.

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Automatic, 1½" Gridley Model F.
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Drill, Allen 2 spindle b. b.
Filing machine, No. 5 Rearwin.
Furnace, Detroit Electric (4).
Grinder, No. 05D Sellers drill.
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199 Bent Street, ... Cambridge, Mass.

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Grinder, No. 16 Blanchard, 30" chuck.
Jig borer, No. 2 Pratt & Whitney.
Lathe, 16"x10' Hendey like new.
Miller, No. 2 Brown & S. univ.
Miller, No. 3B heavy B. & S. plain.
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Cincinnati valve centerless.
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3½" Landis, floor type.
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42" Detrick & Harvey.
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100" Betts.

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14"x6' American geared head.
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16"x8' American geared. head.
16"x8' Lodge & Shipley grd. hd.
16"x10' Lodge & Shipley grd. hd.
18"x8' Lodge & Shipley grd. hd.
20"x8' Monarch.
20"x8' American geared head.
22"x10' Davis.
26"x11' Wicks.
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24" Milwaukee.
26" Stockbridge.

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Nos. 1½ B. S. and 2A Milwaukee.
Nos. 2, 3, 3S and 4 Cincinnati.
Nos. 1½, 2H, 3H and 4B B. & S.
Nos. 2 & 2½ Rockford.
Nos. 2, 2½ and 4 LeBlond.
No. 4 Hendey.
No. 4 Kempsmith Maximill.
Nos. 3A & 3A hvy. Brown & S. univ.
No. 6 Becker vertical.
24" and 48" Cincinnati duplex.
24" and 48" Cincinnati automatic.
24" and 48" Newton rotary.
48" Ohio tilted offset.
48"x48"x8' Beaman & Smith O. S.

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24"x24"x6' Liberty openside.
24"x24"x6' Woodward and Powell.
24"x24" Cincinnati crank.
26" Lynd Farquhar openside.
32"x32"x12" Niles.
36"x36"x8' Gray.
36"x36"x10' Cincinnati.
48"x36"x10' Liberty openside.

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No. 25½ Consolidated horning.
150 ton Ferracute Coining.
400 ton Hamilton Coining.
600 ton Cleveland Coining.
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34", No. 4 Bliss dbl. crank.
48", No. 23C Bliss double crank.
Nos. 1½ & 5A Bliss toggle.
No. 266 Consolidated cam draw.

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Drill, 21", 24", 28" Cincinnati.
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Lathe, turret, 24" Bullard.
Slotter, 20" Betts.
Shear, No. 26 UD Buffalo.
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MODERN MA

PRESSES

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No. 1½ Bliss Cam.
No. 2A, 3A Bliss Horning.
D2,DD2 Ferracute Dbl.Action Drawing
P2, P3, P4 Ferracute Stiles type.
No. 5 Bliss Stiles type.
No. 6 Waterbury-Farrel Double Crank.
No. 30 Toledo Stiles type.
No. 32P Toledo.
No. 35 Toledo Stiles, geared.
S51 Ferracute Double Crank.
No. 54A Toledo Special.
No. 65 Consolidated Straight Side, geared.
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6' Dreses Universal, gear box.
5' American Triple Geared gear box.
2½, 3' Carlton Sensitive.
4' Hammond Jack-Knife.
No. 216, 217, 220, 310, 314, 315 Baker H. D. Upright.
D2, D3, D4 Colburn H. D.
No. 2, 4, 14, 22 Colburn Mfg.
4 spindle No. 2 Colburn Mfg.
21", 22", 24", 26", 32", 40" Aurora Upright.
21", 24", 28", 36", Cincinnati Bickford Upright.
21", 25" Weigel Upright.
22" Barnes all Geared Self-Oiling.
4 spindle 22" Barnes all Grd. Self-Oiling.
3 spindle 22" Hoefer Gang Drill.
3 spindle 22" Rockford Gang Drill.
4 spindle No. 2 Foote-Burte Heavy Duty.
4 spindle No. 4 Foote-Burte Heavy Duty.
4 spindle Moline Hole Hog.
5 spindle Detroit Semi-Automatic.
6 spindle No. 2 Foote-Burte.
6 spindle 21" Hoefer Gang.
No. 00S Garvin Horizontal Duplex.
6 spindle National-Acme Semi-Automatic Horizontal.
No. 1 Pratt & Whitney 2 spindle Gun Barrel.
D2 Fox Multiple Straight Line.
No. 2 Baush Multiple.
No. 5D, 7D Moline Hole Hog, late type.
No. 10C, 18, 30 Natco Multiple, m. d.
No. 25 Baush Multiple.
No. 26C Fox Multiple.
No. 37 Natco Multiple.

GRINDERS

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No. 2 Diamond Auto. Surface, belt.
No. 2 Diamond Auto. Surface, m. d.
No. 2, 3 Brown & Sharpe Automatic Surface belt.
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60" Springfield Face, m. d.
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No. 1 Norton Univ. Tool & Cutter, belt.
No. 2 Oesterlein Universal Tool & cutter, belt.
Gleason Cutter Grinder, belt
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No. 3 Brown & Sharpe Universal, belt.
12x36" Cinc. Self-Cont. Universal 3 motor drive.
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6x32", 10x36", 10x50", 10x72", 12x72" 14x72" Norton Plain Cylindrical, belt and motor drive.
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CHINE TOOLS

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2 spindle Allen, 12" overhang.
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2 spindle No. 2 Avey.
2 spindle Fosdick.
2, 4, 5 spindle Henry & Wright.
2 spindle Leland & Gifford.
2 spindle Leland & Gifford direct m. d.
3 spindle Demco, power feed.
4 spindle No. 2 Avey-Matic, m. d.
3 spindle Sipp, power feed.
4, 8 spindle Allen.
4 spindle No. 3 Avey.
6 spindle No. ½ Avey.
6 spindle No. 1 Avey-Matic power feed.
6 spindle No. 3 Avey.
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ENGINE LATHES

60"x48' Niles, two carriages belt.
36"x18' LeBlond Geared Head.
36"x18' American, cone, taper.
36"x11' American, cone.
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30"x14' Lodge & Shipley, cone.
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30"x11' American, cone.
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26"x24' Niles cone.
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24"x14' Schumacher-Boye, cone.
24"x12 Schumacher- Boye, cone.
24"x12' LeBlond, cone.
24"x10' Greaves-Klusman, cone
24"x10' Boye & Emmes, art. m. d.
21"x12' LeBlond Geared Head, taper.
21"x10' LeBlond Geared Head, taper.
20"x10' Monarch Geared Head, gap.
20"x10' Hendey Geared Head, taper.
20"x10' Hendey Yoke Head, taper.
20"x10' LeBlond, cone.
20"x10' Boye & Emmes, cone.
20"x10' American, cone.
20"x6' Hendey, yoke head.
18"x8' Lodge & Shipley, Geared Head.
18"x8' Greaves-Klusman, cone.
18"x7' Chard, cone.
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16"x6' Hendey Yoke Head, taper.
12"x6' Hendey Geared Hd., m.d.,taper,

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No. 1, 3 Kempsmith Plain, cone.
No. 2HD LeBlond Plain, cone.
No. 2H, 3 Brown & Sharpe Plain, cone.
No. 3 Hendey-Norton Plain, cone.
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No. 13B Brown & Sharpe Plain, s.p.d., taper spindle.
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4" Pratt & Whitney Spline, m. d.
6x14", 6x80" Pratt & Whitney Thread.
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24" Cincinnati Duplex, Auto. belt &m.d.
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MISCELLANEOUS

20' Bending Rolls, cap. 1" plate, Niles.
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15, 30 ton Lucas Power Forcing Press.

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Manufacturing

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Potter & Johnston Nos. 6A and 7A.
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NBP 86"x19' geared head.
Pittsburgh 50"x73' grd. hd.
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Pittsburgh 36"x38' grd. hd.
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Bridgeford 36"x60' boring & turning.
Bridgeford 36"x60' boring.
McCabe 26-45"x12' double spindle.
McCabe 24-48"x14' double spindle.
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And 200 other lathes from which to select.

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NATIONAL ACME Model C, 1" cap. 5 spindle Automatic.
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Becker No. 4B, C-1 and C vertical.
Pratt & Whitney 6x14, 6x48 thread.

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Dreses 3'.
Morris 3½'.
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Niles Bement Pond 5', 8'.

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An assortment of 1, 2, 3, 4 and 6 sp. high speed ball bear. drill presses. What are your requirements?

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Fellows Nos. 7, 71, 712 gear shapers.
Fellows No. 8B burnisher.
Lees Bradner planisher.
Gleason 24", 37" gear planers.
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Cleveland 8 spindle gear hobber.

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Libby 26" Turret; grd. hd.; 7½" spdl.
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Gisholt 24" Turret.
Foster Nos. 1B &2Buniv. Turret.
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1000 other machines in stock—Ask for details

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410 Broome Street, New York, N. Y.

High Grade Machine Tools

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42"x20' American Super Production geared head, 18 speed, motor driven, rapid traverse.
18"x10' AmericanGeared Hd.S.P.D.
36"x14' Boye & Emmes, cone, q. c.
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36"x20' Bradford cone, Loose Chge.
24"x16' Lodge & Shipley sel. grd. hd. S. P. D.
36"x18' American g. h., s. p. d.
28"x48"x10' Harrington, Slid. Bed.
20"x10' American Grd. Hd. S. P. D.
20"x8' Am. Grd. Hd., M. D., late.

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16"x52" Landis self contained.
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Type A Production Abrasive Finishing Nos. 50, 55, 60, 65 and 70 Healds.
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No. 4, 48" Brown & Sharpe.
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18-H Gould & Eberhardt Hobber.
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1½" Landis Double Spindle Lanco Hds.
2" Landis Double-Spindle.

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42" Bullard S. P. D.
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42" Niles Boring Mills, 2 heads.
14' Betts, Cone Drive.
60" Niles Boring Mill, 2 heads.

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No. 4 Cinti. High Pwr. Univ. S.P.D.
No. 2 & 3 Kempsmith Plain, M. D.
No. 3 LeBlond H. D. Plain.
No. 3 Kempsmith Universal.
No. 2 Rockford Universal, complete.
No. 3-B Milwaukee Pl., Dbl. O. A.
5B Becker Vertical Mill.
5" Pratt & Whitney Automatic.
18" Cincinnati Plain Mfg. Miller.
Briggs Manufacturing Miller.
No. 7-H Becker Lincoln type.
No. 1 Knight Miller and Driller.

Planers

30"x30"x8' American two heads.
30"x30"x16' Gray, two heads.
24"x6' Ohio.
24"x24"x14' Gray, box table.
42"x42"x10' Cleveland Openside, 3 heads, A. C., M. D.

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24" Cincinnati Bickford Upright, tap.
2½, 3, 3½, 6' Cinci.-Bick. S. P. D.
3, 3½, 4 American Trip. Pur. S.P.D.
3' Bickford Plain, S. P. D.
No. 2 Colburn Mfg. H. D. 2-spindle.
No. 40 Natco Straight Line Multi.

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20" Ohio, motor driven.
16", 20", 24" Gould & Eberhardt motor drive, thru gear box.
16", 20" and 24" G. & E., cone drive.

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80lb. Bradley Cushion Helve Hammer
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96A Toledo Double Crank Press
No. 163B Consolidated Dbl. Crank.
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Nice Variety of Sizes of Presses.

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5" bar NBP. floor type.
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No. 3-A Universal, 3" bar.
No. 1 Cleveland, 2½" bar.

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20" Barnes, all geared.
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3' Carlton.
4' Fosdick.
5' American, full univ., m. d.
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6' American Triple purpose.

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Nos. 9-H & 18-H G. & E. hob.
No. 16HSB Gould & Eberhardt.
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6" & 18" Gleason bevel gear.
37" Gleason bevel planer.

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6"x32" Norton.
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10"x50", 72", 96" Norton.
10"x36", 52" Landis.
14"x36", 50", 72" Norton.
18"x96" & 18"x120" Norton, m. d.
20"x168" Landis, m. d.

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No. 2 & No. 2½ Bath universal.
No. 1½—10"x30" Landis.
No. 4—12"x66" Landis.

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No. 1½ Landis, Internal.
No. 70 Heald, Internal
No. 10 & No. 16 Blanchard surface.
No. 16 A Blanchard surface.
No. 25 Heald rotary surface.
15"x17"x72" Norton, o. s., surf.
No. 1 Gardner, hyd., face.
36"x84" Diamond, hyd. face.

Lathes
No. 3 L. & S. Duomatic.
No. 12 LeBlond Multi-Cut.
14"x6' Lodge & Shipley.
18"x10' American geared head.
20"-22½"x8', 14' L. & S. sel. g. h.
24"-27½"x12', L. & S. sel. g. h.
28"—27"x26' LeBlond.
27"—30"x16' L. & S., sel. g. h.
36"x18' L. & S. Patent hd.
38"x30' Rahn-Larmon grd. hd.
54"x23' Johnson, T. G.
66"x21', 39' Putnam t.g., m. d.

Millers (Plain and Universal)
Nos. 0, 2-B, 3-B, 4-B B. & S.
Nos. 1-B & 3-B Milwaukee s.p.d.
Nos. 2 & 3 Cinn. h. p., s. p. d.
No. 4 Kempsmith Maximiller.
Nos. 4 & 5 Cinn. h. p., s. p. d.

Millers (Mfg.)
No. 3 Sundstrand Rigidmill.
No. 4—36" Cincinnati hydromatic.
No. 5 48" Cincinnati hydromatic.
18" & 24" Cincinnati automatic.
No. 4, & No. 8 Lees-Brad.
36"x36"x12' Newton Duplex.
38"x44"x20' Ingersoll slab.

Millers (Vert.)
No. 3-B Milwaukee.
No. 3 Cincinnati h. p.
No. 6 Becker vertical.
No. 5 Brown & Sharpe.

Planers
24"x24"x12' Gray.
30"x30"x14' Gray, rev. m. d.
30"x30"x6', 18' Cincinnati.
36"x36"x8', 18' Cincinnati.
36"x36"x12' and 24' Gray.
36" x 36" x 14' - 24' Cleveland o.s.
42"x42"x30' N-B-P, Rev. m. d.
48"x48"x10' Gray.
48"x48"x12' Cleveland, openside.
48"x48"x14' Liberty, openside.
56"x56"x32' Cincinnati.
60"x48"x16' Gray max. service.

Presses
No. 106 Bliss Gap, dbl. crank.
No. 96-F Toledo, double crank.

Shapers
16" Gould & Eberhardt, m. d.
20" & 24" Gould & Eberhardt.

Turret Lathes
No. 4 W. & S.; Timken bearings.
No. 1-A Warner & Swasey.
No. 3A Warner & Swasey.
No. 2-B and No. 3-B Foster.
No. 4-L Gisholt, 9½ h. s

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1¾" Gridley.
2½" Gridley Single Spindle M. D.
No. 2G Brown & Sharpe.
Nos. 23, 24 & 34 New Britain chkg.

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2½" N. B. P. knee type.
3½" bar, Landis No. 35 floor type.
4½" bar N.B.P. 72" table type.
3½", 5½" D & H. floor type.

BORING MILLS, Vertical

24" Bullard, New Era.
42" Bullard, Power Rapid Traverse.
72" Betts heavy duty.
72" Bullard, Self Contained.
10' Niles, Pwr. Rap. Trav., M. D.
8'—12' Ridgeway Extension Type.
10' Pond, h. d., cone.

DRILLS, Radial

4' and 6' Mueller, Gear Box (2).
No 2 Aveymatic 2 Spindle.
4' Hammond Sensitive.
5' Western m. d.
6' N. B. P. right line, a. c. m. on arm.
6' Cincinnati B., gear box, s. p. d.
25 H. S. and Multiple Drills, etc.

GRINDERS

No. 1½ Landis Univ. 10"x30".
10"x36" Landis Plain (3).
12"x36" Landis Plain.
6"x32" Norton, self-contained.
14x72" Norton, cylinder, s. c.
15x15x72" & 6"x10"x36" Norton surf.
48" Badger face, Hyd. Feed.
No. 2 Diamond 36"x12".
84" Diamond, face.
Nos. 50, 55 and 65 Heald.
52" Besley Vert. Spin. Disc.
Universal, chucking, disk, etc.
No. 2 Oakley T. & C.
No. 33 Abrasive Surface (2).

GEAR CUTTERS

60" B. & S., No. 6 spur.
No. 13 Brown & Sharpe, S. & B.

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Nos. 6B and 2B Nazel.
200 lb. Bradley, cushioned helve.
400 lb. Bliss, belt drop.

KEYSEATERS

No. 3 Mitts & Merrill.
No. 3L LaPointe Hydr. Broach.

LATHES

18"x8' American, Cone.
20—14", 16", 18", 20", belt & g. h.
24"x12' Putnam, q. c. g., cone.
26"x11' Boye & Emmes QCG Cone.
26"x21' N. B. P. Cone q. c. g.
No. 1 N. B. P. Car Wheel m. d.
32"x12' Bridgeford, grd. hd., q. c. g.
32/54"x22' McCabe Dble. Spin.
36"x30' N. B. P. Grd. Hd. 2 Car.
36"x26' L. & S. cone, q. c. g.

MILLERS, Production

8"&12" Pratt & Whitney.
28" Cincinnati Semi Automatic

MILLERS, Vertical

CS Becker Continuous, No. 3 Beck.
No. 14 Garvin, table 20x48.

MILLERS, Plain

No. 3 Cincinnati, grd. hd., P. R. T.
No. 4 Cincinnati, grd. hd., P. R. T.
No. 2 Kempsmith Maximiller.
No. 2 B. & S., cone, Cullman m. d.
No. 2B Heavy, B. & S.
No. 1 LeBlond, cone, Cullman m.d.

MILLERS, Universal

No. 2A Brown & Sharpe s. p. d.
No. 2 Owen Cone.

MILLERS, Planer Type

Ingersoll adj. rail, 36"x30"x12'.

PIPE MACHINES

8" and 6" Saunders, Cone.
8" Jarecki, gear box, m. d.
2" Bignall & Keeler, m. d.

PLANERS

84"x84"x18' N.B.P M.D. 4 Hds.
42"x36"x14' N.B.P. Rev. M. D.
48"x48"x10' D & H Openside.
30"x30"x10' D & H Openside.
72"x60"x18' D. & H. Opens. M. D.
48"x36"x16', N. B. P., box table.
42"x36"x12' & 24"x24"x6' Cinci., m. d.
17"x17"x4' Whitcomb, m. d.

PRESSES

No. 58½ Toledo SS Grd.
200 ton N. B. P. Hor. Hyd. Carwh.
400 ton Wood Hor. Hyd. Carwheel.
600 ton Niles Hor. Hyd. Carwheel.

PUNCHES and SHEARS

54" H. & J. No. 2 double end.
No. 26UD Buffalo Armor.
No. 1 Buffalo Trpl. Comb'n. Armor.

ROLLS

17"x1½" Niles A. C. m. d.
16"x1½" Wickes, pyramid type.
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10"x½" Bertsch, pyr.
8"x½" Pyramid.

SAWS

No. 8 Marvel Metal Bandsaw.
No. 2B Gorton Internal, 7½".
6" Peerless univ., shaping.
No. 16 Higley, cold, m. d.
No. 4B Cochrane & Bly.

SHAPERS

24" Stockbridge, a. c., m. d.
20" Rockford, gear box, m. d.
16", 20" & 24" G. & E.

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No. 2 Bardons & Oliver, 1" capacity.
14" Acme m. d., 1-3/16" cap.

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Gang Slitters, 32 & 36".
Grinder, disc, Gardner 30", b. b.; cyl. Landis 12x42"; 14x72 Norton
Groovers, power, 8' and 3' Nia., 48" Stoll,
Hammers, 100 lb. Bradley, helve.

Presses, No 137-C Stoll, 3" str. 48" bet. No. 102 Bliss-Cons. Stiles type, P2, P3 Ferr., 34P Toledo, 224 Adr. b. g. 5" str.
Presses, O. B. I., No. 2 V. & O. No. 3 L. & J. No. 2 Rockford.
Press, hydraulic, 200 ton, 38"x62" between posts.
Press brake, 10' 18 ga. Ohl.
Radial Drill, 5' and 6' Fosdick.
Saws, 6"x6" Peerless hack; 9"x9".
Saws, No. 1 Ryerson Friction.
Screw mch., No. 1 B. & S., m. d.
Shaper, 24" G. & E., s.p.d. hi-duty,

EXCEPTIONAL

Drawing press, No. 13 Bliss toggle 9" shaft, 40" bet. housings.
Grinder, disc, No. 24 Gardner 53"
Grinder, face, Diamond 84", m. d.
Planers, Clev. opens. 30"x8'.
Press, coining, 800 ton, tie rod.

Press, No. 501 Ferracute 400 ton s. s., 11½" stroke, tie rod frame.
Shear, gate, 10'⅜" W. & W., 15" gap.
Shears, 6'⅜" 24" gap; Chicago Steel 10' 7/16".

Lathes, gd. hd., 25"x16' Ryerson.
Lathes, 18"x8' Hendey, t. a., Gisholt, 5½" hole in spdl., 30".
Mill, Ingersoll, 24x28x12' 4 heads.
Millers, auto. 17" & 24" Cinc.
Millers, plain, Kearney & T., s.p.d. No. 1½, No 2; B. S., No. 1A.
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Multiple Punches, No. 10 and 12
Wells, 6' bet. hous.: W. & W., 48".
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Planers, 72"x18', 3 heads. 54"x10' Gray.

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Welder, butt, 20 k. w. National.
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Size A. L. & A. 2" thru 1⅛", Single End, 36" Throat, Motor Drive.
No. 000 H. & J. ⅝" thru ⅞", Single End, 18" Throat, Motor Drive.
No. 2 H. & J- 1" thru 1", Single End, 15" Throat, Motor Drive.
No. 3 H. & J. 1½" thru 1", Single End, 30" Throat, Motor Drive.
No. 10 Beatty Heavy Duty Beam, Ram 42"x34", with Spacing Table.
No. 7 Beatty 1¼" thru 1", Single End, 42" Throat, Motor Drive.
No. 5 Beatty ¾" thru ½", Single End, 15" Throat, Flywheel Type.
Rock River ⅞", thru ¾", Single End 36" Throat, Motor Drive.
Kling, 2¼" thru 1¼", Single End, 18" Throat, Motor Drive.

SHEARS

Long-Allstatter ¾"x42", 8" Throat, Motor Drive.
No. 6 Hilles & Jones ⅞"x96", 36" Throat, Motor Drive.
No. 6½ Hilles & Jones 1"x96", 36" Throat, Motor Drive.
No. 7 Hilles & Jones 1¼"x12', 36" Throat, Motor Drive.
Loy-Nawrath, 3/16"x10', Squaring Shear, Back Gauge, Motor Drive.

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2 Sizes 8 Thomas Angle Punches with 50' Tables. Motor Drive.
1 Size 8 Thomas Plate Punch 42" Throat, With Table, Motor Drive.
1 Thomas Plate, With Kling 72" Throat Punch, Punch Plates up to 60"x120".

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No. 2 Hilles & Jones Straightening Roll, ¾" Plate, 50" wide, Motor Dr.
No. 1 Hilles & Jones Bending Roll, 6'x⅜", Drop End, Belt Drive.

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Williams White Beam Bender, 15" Beams, Motor Drive.
No. 5 and No. 7 Williams White Bulldozers, Belt Drive.

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1—30"x16' H-S-Gamble.
1—24"x30' Lodge & Shipley.
1—16"x10' Lodge & Shipley lathe.
1—18"x8', 14"x8' Lodge-S., G. H.

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1—36" Bullard Rapid Production.
1—51" Bausch.
1—42" Colburn Vertical.
1—62" Niles Vertical.
1—72" Niles-Bement-Pond.
1—84" Bullard Vertical.
1—90" Betts Vertical.
1—No. 40 Landis Horizontal, Floor.
1—10-16' N.-B.-Pond Vertical.
1—No. 6 Barrett Horiz. Mill 8" Bar.
1—10' Niles Vertical Boring Mill.

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1—No. 4-A Brown-Sharpe Univ.
1—No. 3-S Cincinnati Plain.
1—No. 2 Kempsmith Universal.
1—No. 4-B Brown & Sharpe Plain.
1—No. 4 Cincinnati Hi-Power Plain.
1—No. 3-B Brown & S. plain miller.
1—No. 5 Cincinnati Plain.
1—No. 5 Brown & S. plain miller.
1—No. 2 Van Norman Duplex.

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1—3' American High Speed Plain.
1—3' Cincinnati-Bickford Radial.
3—5' Niles Right Line Radials.
1—4' Fosdick Plain.
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1—No. 14 Natco Multiple.
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1—No. 2 Colburn four-spindle.
1—No. 4-D Colburn.
1—No. 1 Garvin Duplex Horizontal.
2—No. 12 P. & W. multiple spindle.
1—24-Spindle Bausch Heavy Duty.

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1—42"x42"x20' Niles Planer.
1—48"x48"x10' Niles-Bement-Pond.
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1—56"x56"x14' Gray.
3—72"x72"x12' Pond.
1—36"x36"x12' Cincinnati 4 heads.
1—25' Niles Plate.

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1—18"x"84 Landis Grinder.
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13/32	.35	1	1.00	1 19/32	1.00
7/16	.35	1 1/32	1.00	1 5/8	1.00
15/32	.35	1 1/16	1.00	1 21/32	1.00
1/2	.50	1 3/32	1.00	1 11/16	1.00
17/32	.50	1 1/8	1.00	1 23/32	1.00
9/16	.50	1 5/32	1.00	1 3/4	1.00
19/32	.50	1 3/16	1.00	1 25/32	1.00
5/8	.50	1 7/32	1.00	1 13/16	1.00
21/32	.50	1 1/4	1.00	1 29/32	1.00
11/16	.50	1 9/32	1.00	1 7/8	1.00
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Automatics, 5 spindle Acme, 1".
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Hammer, 500 lb. Bradley.
Portable Burning Machine.
Grinder, No. 12 B. & S.
Cleveland, 1½ Model M.
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72" Colburn Vert. Bor. Mill B. M. D.
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3½" Bar, Landis, No. 35, motor dr.

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No. 3 Cincinnati Hi-Pow. m. d.
Model CS Becker, Continuous, Vert.

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66"x30' Johnson, cone dr., hvy. duty.
28"x18' Chard, cone drive.
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96"x96"x20' D&H, Rev. m.d. 4 hds., Rap. Traverse.
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No. 4-6 Warner S. univ., bar equip.
No. 5 Foster univ., late, bar equip.
No. 2-A Warner Swasey, chucking.

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No. 4-H LeBlond, s. p. d.
No. 5-B Becker vert., pow. fd. to hd.

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No. 14 Pratt & Whitney Vertical ball bearing Surface Grinder.
No. 2 Oakley Universal Tool & Cutter Grinder, power feed.
No. 51 Hydroil hydraulic Internal Grinder.
5—7½ HP Bridgeport heavy duty M. D., Snagging Grinders.
No. 416 Baker heavy-duty, single pulley drive, Drill.
No. 314 Baker heavy-duty, single pulley drive, Drill.
No. 6 Warner & Swasey friction head Turret Lathe, with air chuck.
No. 5 Foster Universal FGH, hand screw machine with wire feed.
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18"x8' Monarch HD, QC, Engine Lathe.
26"x12' Schumacher & Boye standard Engine Lathe.
14"x19' Faye Automatic Lathe.
10—Automatic Threading Lathes.
26" Universal combination Planer & Shaper, M. D.
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No. DDG4 Ferracute cam drawing Press.
48x48x10' Cincinnati heavy duty planer, two heads on cross rail.
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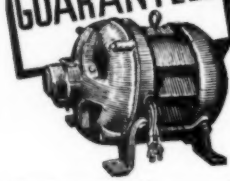

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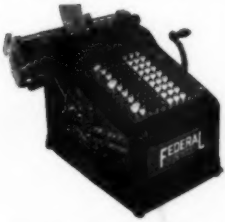

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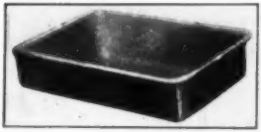

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24"x22' American q. c.
32"x12' Boye & E., cone head q. c.
36"x16' Lodge & Shipley s. p. d.
36"x36' LeBlond q. c. motor drive.

PRESSES

No. 4 & 5 Consolidated inclinable.
No. 165 Consolidated dbl. crank 36".
No. 21 & 21½ Bliss Inclinable.

WELDERS

20 k. w. National spot, 36" arms.
10 and 12 k. w. Federal.

MILLING MACHINES

No. 2 Cincinnati univ. s. p. drive.
No 3 Kemp. univ. 3 step cone, d. b. g.
No. 34 Oesterlein plain, cone drive.
No. 3B Brown & Sharpe, s. p. dr.
No. 4 LeBlond plain 3 step cone.
No. 6 Becker vertical, rotary table.

MISCELLANEOUS

Bulldozer, No. 4 Rock River, m. d.
Bolt cutter, 1½" Landis dbl. spindle.
Bolt cutter, 1½" & 2" Acme.
Gear cutters, Nos. 3, 4 B. & S.
Hack saws, 12x15 Racine.
Keyseater, No. 2 Mitts & Merrill.
Radial, 4' Hammond, sensitive.
Radial 6' Dreses, s. p. drive.
Straightening rolls, 54" H. & J.
Shaper, 32" Cincinnati, motor drive.
Square shear, 48"x14 ga.
24" Libby turret, s. p. drive.

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The Jones Machine Tool Co.

Front & Pike Sts., Cincinnati, Ohio

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Automatic, No. 00 B. & S.
Boring Mill, 42" Gisholt M. D.
Brake, 6', 3/16" cap. Power.
Die Heads, large stock Geometric.
Drills, 1, 2, 3, 4 & 6 spdl., ball bearing, Leland & Gifford, Avey; 20" and 25" Barnes b. g., p. f.
Grinders, No. 1½ Landis, universal; 26" Badger disc, ball bearing; 16x32 Landis crankshaft; No. 65 Heald.
Millers, 12" Cincinnati B. G.; No. 2 Cincinnati plain; No. 2 Kempsmith universal; No. 3 Kempsmith, plain & univ.; No. 24" Cincinnati auto.
Nibbler, No. 1 Campbell.
Planers, 24"x6' & 8' Gray, 1 head.
Punch presses, o. b. i. No. 3½ Toledo. No. 20 Bliss.
Punch presses, Nos. 1 & 1½ Bliss cam draw; Horning; No. 23 Cons.

SPECIALS

No. 5 CINCINNATI rectangular overarm Milling Machine, m. d.; 16"x10' HENDEY LATHE, taper attachment; 16"x8 MONARCH Geared Head Timken Bearing Motor Driven Lathe with collets; No. 260 Heald Rotary Surface GRINDER, 16" chuck; 24" AMERICAN Shaper, Motor Drive.

Hacksaws, Nos. 1, 2 Marvel; 6x6, 9x9 Peerless.
Lathes, 13"x8' Willard, s. q. c., collets & taper att.; 16"x10' Hendey, taper attach.; 16"x10' Seneca Falls, q. c. g.; 17"x8' LeBlond grd. hd., m. d.; 24" x 12' S. & B. q. c. g., taper att.; 4½x60 Fitchburg Lo-Swing.
Millers, vertical, No. 3 Becker.
Punch & Shear, No. 53 Beliot.
Screw mchs., Nos. 0, 1, 3, 5 Foster.
Shapers, 14" to 28" G. & E., s. p. d. 7" Rhodes comb. with slotter.
Shears, 30" Bertsch corrugating; No. 05 Niagara ring & circle, m. d.
Thread Miller, 6x60 Pratt & W.
Welders, arc, 200 Amp. USL.
Welders, spot, 5 K. W. Dyer, 10 & 20 K. W. Taylor.

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51" Niles, 2 heads.
36"-44" N. B. Pond, side head.
60" Bullard, 2 heads.
Lucas 2½" horizontal.
Fosdick 4" horizontal.

LATHES

14"x6' Prentice, geared head.
14"x6' Bradford, relieving attach.
19"x10' LeBlond, taper.
20"x40"x14' Rahn Larmon Series AG Sliding Bed Gap Lathe.
26"x14' Putnam.
40"x18' Prentice, raised to 52½".

SHAPERS AND GEAR CUTTERS

16" Milwaukee, cone drive.
28" American, cone drive.
No. 6—60" B. & S. Gear Cutter.
72" B. & S. Gear Cutter.

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10'x10 gauge Ohl, motor driven.

MILLING MACHINES

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No. 1 Kearney Trecker.
No. 1½ American.
No. 4 Cincinnati.
No. 4 LeBlond universal.

TURRET LATHES

Nos. 2-A & 3-A W. & S. H.-Hd.
Nos. 4 and 6 Warner & Swasey.
2-A W. & S., bar and chuck.
6¼" Gisholt, motor driven.

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No. 9 Racine Hack Saw.
3—3' American Sensitive Radials.
No. 074 Consolidated Press.
No. 164 Toledo draw. toggle press.
11"x14" Worthington Compressor, motor driven.
No. 21 Bliss O. B. Inclinable.
No. 10½ Badger State Punch & Sh.
2½" Landis Bolt Cutter, lead scr.
3" Acme Bolt Cutter, Landis hd.

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No. 2, 3 CINCINNATI PLAIN MILLERS, Cone Drive.

16", 20", 24" GOULD & EBERHARDT SHAPERS Cone Drive.

2, 3, 4, 8 Spindle LELAND GIFFORD DRILLS.

No. 3, 12 BARBER COLMAN HOBBERS.

No. 6, 9, 12 LEBLOND MULTI CUT LATHES.

No. 4, 6 WARNER & S. TURRET LATHES.

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Grinders, No. 70 Heald Internal(3)
Grinder, No. 3 Wilmarth & M. surf.
Grinder, 10 & 12" Arter Rot. Surf.
Grinder, 53" Gardner, Verti. m.d., with automatic feed.
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Hobber, No. 16 G. & E., S. P. D.
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Lathe, 18"x8' Hendey, B. M. D.
Lathe, Turret, No. 6 W. & S. univ.
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Mill, No. 3 Van Norman, m. d.
Mill, No. 3 GH Hendey Univ., s.p.d.
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Press, No. 66 Bliss, S. S., Tie Rod.
Press, No. DG53 Ferracute S.S.(3)
Press, No. 14 Adriance Cam.
Presses, P-2, P-3, P-4, Ferr., m.d.
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Shear, 72"—10 ga. Bertsch.
Shear, 10', ¼" United Eng'g, m. d.
Shear, 10', 3/8" Pittsburgh, m. d.
Shear, No. 736 Nia., 36", 3/16" cap.
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21"x10' LeBlond extra heavy duty

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21" and 24" Gisholt.

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20" Smith & Mills.
24" Barker.
14" Niles travelling head.

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6' ceiling.
4, 24" Foote-Burt, single base.

MILLING MACHINES

No. 2 Kempsmith universal.
No. 4 LeBlond plain.
No. 2 Brown & Sharpe, heavy.
24"x20"x8' Ingersoll.

MISCELLANEOUS

Band saw, Clark, compound.
Gear miller, No. 1 Bilton.
Planers, Gray, 36" and 42".
Press, No. 2 Toledo O. B. I.
Press, Cam Drawing, No. 24 Toledo
Sand Blast, Boland.
No. 20 Bryant grinders (5).
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26"x24' Putnam.

MISCELLANEOUS

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Turret Lathes, 6¼" hollow spindle x 24" Gisholt.
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Grinder, No. 10—6"x20" Brown & Sharpe Plain Self-contained.
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Grinder No. 16 Blanchard Direct Motor Drive, 30" chuck.
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LeBlond 18"x8' l.c.g.;d.c. mtr.driven.
LeBlond 17"x6' Mfg. Type; cone dr.
Bradford 16"x8' hd. q.c g. lathe; c. d.
LeBlond No. 12 multi-cut; complete tooling; s. p. d.
American 12"x5' l.c.g.; motor driven.
11"x4' South Bend q. c. g.; collet att.; b. d.
9"x3' South Bend l.c.g.; collet att.;b.d.
McCabe 50—27" dble. spindle Lathe, d. c., m. d.

TURRET LATHES

J. & L. 2-sp. turret; g.h.; chuck.;s.p.d.
Gisholt 28" tilted tur.; 7½" hole; m. d.
Gisholt 21" tilted type turret lathes, motor drive, (2).
Gisholt No. 1-L.h.p. tur. late type;m.d.
W. & S. No. 4 turret lathe; d.c., m.d.
Acme 3¼"—36" grd. bd. turret; s.p.d.

MISCELLANEOUS

Atkins No. 3 metal cutting band saw, belt drive.
Foedick No. 2-A horiz. floor type bor. mill, b. d.
Minster 10'x10 ga. press brake; s.p.d.
10'x14 ga. Chicago steel brake hand.
Grand Rapids No. 4 Drill Grinder; motor driven.
Smith & Mills 28" shaper; a. c. m. d.
Gould & E. 30" Shaper; motor driven.
Cincinnati 24" shaper; b. g.; cone dr.
Ohio 22" shaper; b. g.; cone driven.
American 20" shaper; b. g.; s. p. d.
Smith & Mills 12" plain crank; b. d.
Bliss No. 465 gap shear; ¼"x8'; m.d.
Bliss No. 21 o. b. i. punch press; b. d.
Racine 13"x13" hack saw; b. d.; h. s.
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Cincinnati No. 4 High Pwr. pl. s.p.d.
B. & S. No. 4-B heavy plain; s. p. d.
Cincinnati Nos. 4, 3, 2 pl.; cone dr.
American No. 1½ pl.; p. f.; cone dr.
Rockford No. 1½ plain; cone driven.
Cincinnati No. 3 univ ; p. f.; cone dr.
Becker No. 6 vertical h. d.; cone dr.

GRINDERS

B. & S. No. 26 plain cylindrical; b. d.
B. & S. No. 11 plain cylindrical; b. d.
No. 2 Diamond surf. grinder, motor dr.
Ott No. 8 plain cyl. Grinder; 6"x18"; belt drive.
Modern 12"x24"; pl. cylindrical; b. d.
Abrasive No. 3 late type surface; b. d.
Abrasive No. 33 vertical spindle surf. grinder, motor drive.
Landis No. 1½ universal & tool; b. d.
Heald No. 65 Internal gr.; b.d.

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Bausch 8-sp. multi drill; No. 3 mt;spd.
8-spindle Moline hole drill, cone drive.
5' Foedick RC radial drill, motor dr.
3½' Cincinnati-Bickford RC radial, d. c., motor drive.
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Foedick 5' box column radial, s. p. d.
Colburn No. 4 hi duty; m. d , A-1.
Colburn No. 2 hi duty; t. & l. pul. dr.
Baker No. 310 hvy. duty, belt driven.
Foote-Burt hd. prod. 4-spin. drill; pf; s. p. d.
Foote-Burt No. 25 h. d.; sgl. pul. dr.
Foote-Burt 4-spindle rail type; b. d.
Barnes camel back 2-spindle; belt dr.
Barnes 3-spindle 20"; p. f.; belt dr.
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333 West Fourth St., *Est. 1886* **Cincinnati, O.**

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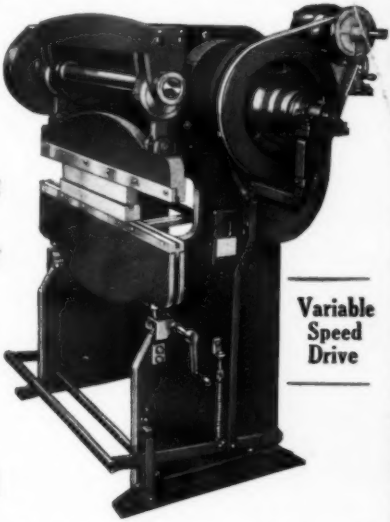

Variable Speed Drive

Economical

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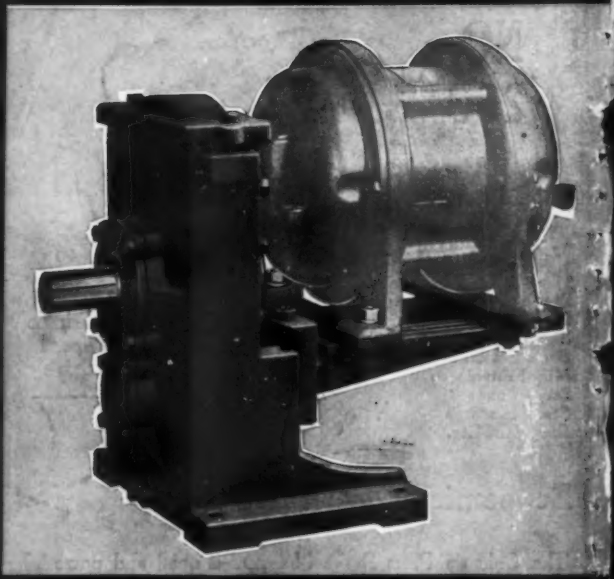
SPEED REDUCERS



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